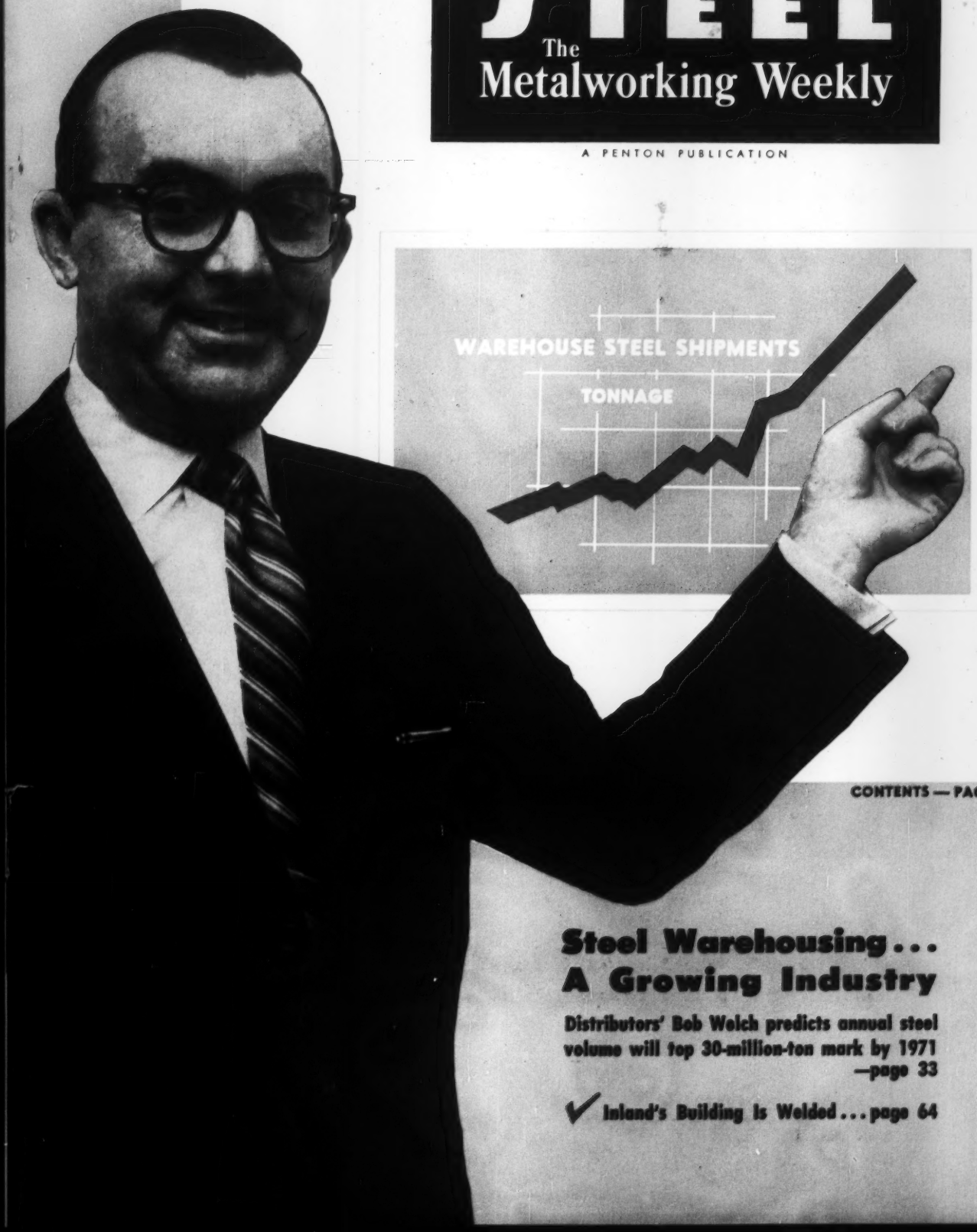
DECEMBER 24, 1956

STEEL
The Metalworking Weekly

A PENTON PUBLICATION



CONTENTS — PAGE 5

Steel Warehousing... A Growing Industry

Distributors' Bob Welch predicts annual steel volume will top 30-million-ton mark by 1971 —page 33

✓ **Inland's Building is Welded... page 64**

Pulling pattern from mold for 12-ton casting

EASY UP does it!

Handling sandslinger sand bucket

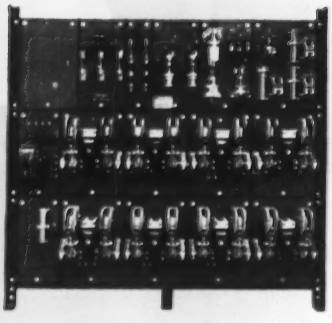
Spotting 15-ton casting on flat-car for inter-plant transportation

Hot metal ladle handled...safely

with A-C power and big assist from

EC&M EDDYMAG®

Hoist Control and Frequency Relay Acceleration



• Here's another example of preference for EC&M *Engineered* Crane Control for industry's tough and critical handling jobs. For its new foundry, The Bullard Company, large eastern machine tool builder, selected EC&M Control for 11 new cranes powered by A-C motors. A thorough study of EC&M apparatus and engineering showed that EC&M circuits were the safest, simplest, and that speed-torque curves of EC&M's EDDYMAG Hoist Control were the finest available. Acceleration by the EC&M Frequency Relay Method was another plus value.

You're ahead in more ways than one when you specify EC&M Control for cranes

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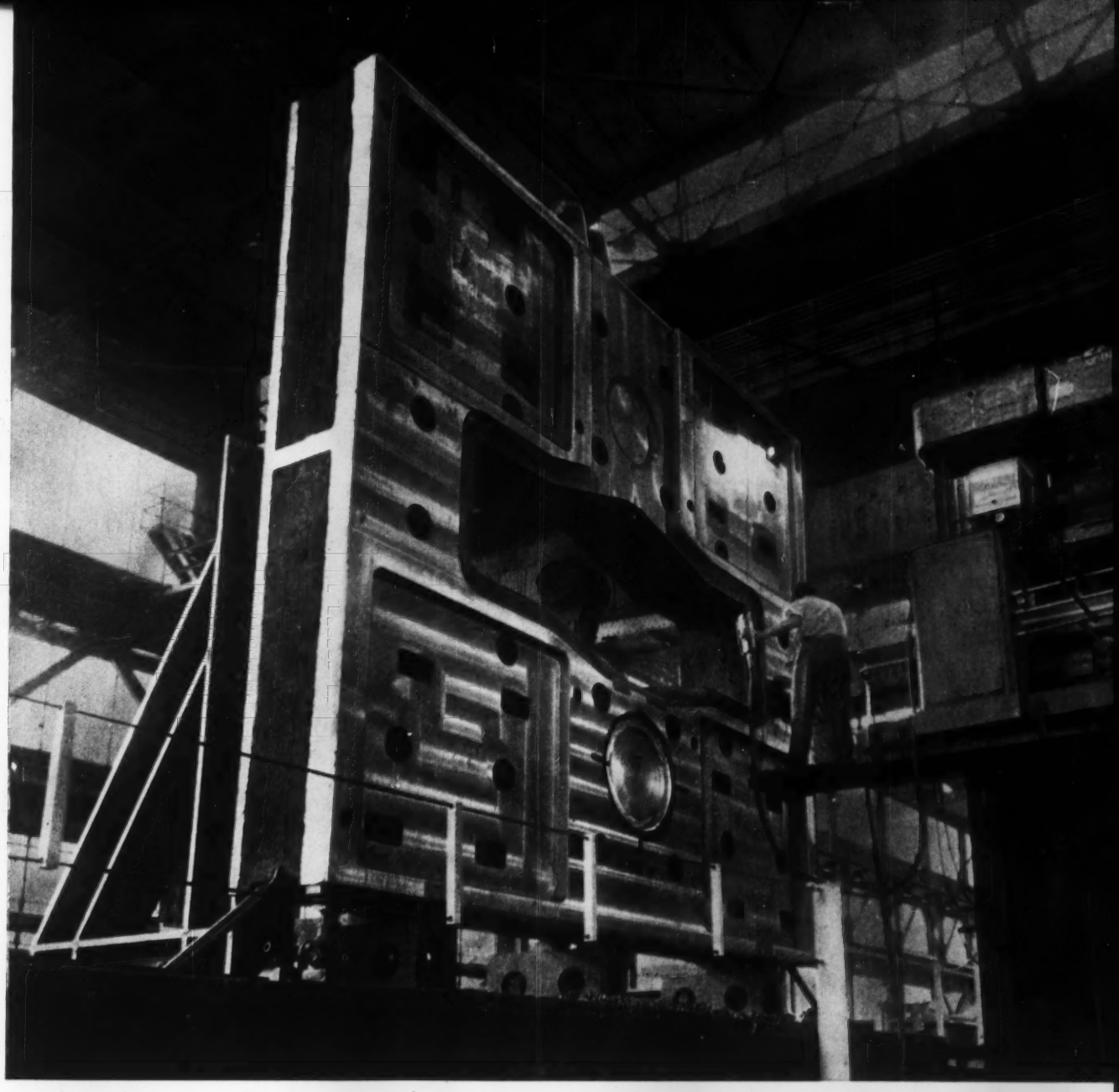

95-ton casting for counterblow forging hammer

This steel casting is of interest for several reasons, not the least of which is its size. By any standards it is a big one—approximately 223 in. long, 202 in. wide, 28 in. deep. As you see it here it has been planed on both sides, and the pockets on the side facing the camera have been milled out.

The huge casting will be used as the base plate of a counterblow forging hammer. The intricate piece was cast in one of the Bethlehem foundries, then moved to a neighboring Bethlehem shop for machining. The plans called for a finished weight of 189,000 lb—almost 95 tons.

Heavy castings like this have been a Bethlehem specialty for years. In design they have ranged from the very simple to the highly complex and difficult. You will almost always see many unusual types of castings in Bethlehem's foundries and machine shops, which are equipped to handle an unlimited variety of work.

If your own jobs require steel, iron, or bronze castings, large or small, we suggest that you be sure to investigate the services Bethlehem offers. They leave nothing to chance. When you are next in the market, we will welcome your inquiries.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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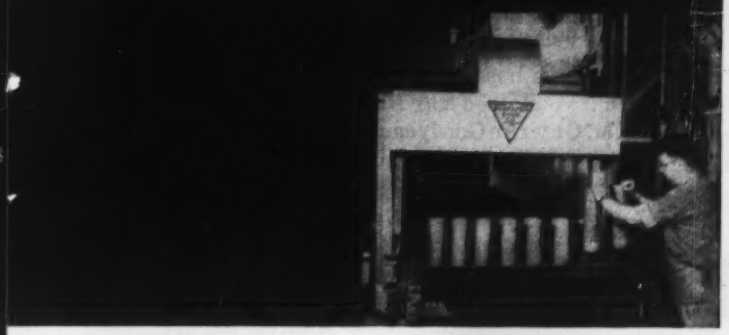

Photos courtesy Despatch Oven Company, Minneapolis, Minnesota.

Cincinnati features bring speed and accuracy in turning out panels for industrial ovens at the Despatch Oven Company.

5′ x 10′ sheets are trimmed four sides—corners are square, sides are clean and straight and panels are sheared accurately to size.

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Despatch Oven Company say—"This shear has brought an operating time saving, reduced time for maintenance. Performance very good."

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A Seamless tube of special synthetic rubber compound resists high concentrations of sulfuric, nitric and chromic acids at temperatures up to 100° F.
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C Tough rubber cover resists abrasion and weather

G.T.M. increases acid hose life by 900%

ACID–66° Baume Sulfuric–was the problem at this eastern steel mill. Many types of hose were tried for its transfer from truck to storage tank. But the best hose delivered *only 2,500,000 lbs.* of acid, before embrittling and breaking.

Then the G.T.M.–Goodyear Technical Man–recommended his new HYSUNITE Hose, specifically developed to handle highly oxidizing acids in high concentrations at temperatures up to 100° F. This rugged hose handled a fabulous *26,500,000 lbs.* of acid–was good for many more pounds – when it was removed from service for thorough checking.

If you have hose problems, it will pay you to consult your Goodyear Distributor and/or the G.T.M. Or write Goodyear, Industrial Products Division, Akron 16, Ohio.

HYSUNITE HOSE by

Hysunite – T.M. The Goodyear Tire & Rubber Company, Akron, Ohio

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In This Issue

STEEL The Metalworking Weekly

December 24, 1956 Vol. 139 No. 26

☑ 27 **Metalworking Outlook**—Air Conditioning Sales Hot

☑ 31 **Editorial**—Merry Christmas!

33 Steel Warehouses Hold Pace
35 Epic Court Decision Coming on Bethlehem-Youngstown Merger
36 Report on Underground Plants
37 Abrasive Wheel Sales Gain
38 Marketing Vice Presidents: What's in a Name?

☑ 40 **Windows of Washington**—Defense Spending To Rise

43 Vending Machines Offer Automatic Lunches
44 Outlook for West Germany, Benelux—Part III of a Series

☑ 47 **Mirrors of Motordom**—Truck Output Recovers

☑ 51 **The Business Trend**—Mid-East Tension Spurs Business Outlook

55 Men of Industry—News About Men You Know
60 Harvey Aluminum Activates 8000-ton Press

☑ 63 **Technical Outlook**—Titanium Scrap Recovery

64 New Chicago Office Building Is Welded
66 Fine Grained Brass Can Be Drawn Deeper
68 Index Machine Triples Output of Instrument Parts

☑ 70 **Progress in Steelmaking**—Bigger Charging Boxes

72 Permanent Molds Gain in Centrifugal Casting
74 New Products and Equipment
77 New Literature

☑ 79 **The Market Outlook**—Price Pressures Persist

81 Next Year Looks Good to Malleable Founders
85 Price Indexes and Composites
86 Steel Prices—Ores, p. 94; Ferroalloys, p. 95
96 Scrap Market Trends—Prices, p. 98
100 Nonferrous Metals
102 Nonferrous Metal Prices
105 Advertising Index

Behind the Scenes, p. 6; Letters, p. 10; Staff, p. 16; Meetings, p. 23; Index available semi-annually. STEEL also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

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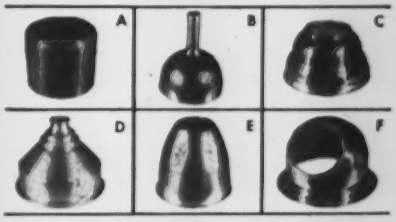
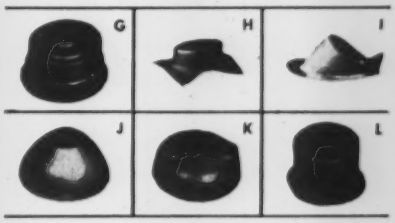


METAL SPINNING AND SPINFORMING:
Typical items: A—Aircraft detail; B—Handle lamp; C—Lamp shade; D—Lamp base; E—Electronic cover; F—Compass cover.



HYDROFORMING:
Typical items: G—Appliance cover; H—Jet engine detail; I—Aircraft detail; J—Jet engine detail; K—Cleaner cover; L—Motor housing.

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STEEL can put you in touch with the important ones, those that do more than 92% of the industry's business. Tell the buyers and specifiers in these plants of the machines or materials you have for sale through an "Equipment — Materials" advertisement. For rates write STEEL, Penton Building, Cleveland 13, Ohio.

behind the scenes

Up! The V.P.s!

Last February at the Statler hotel in New York, A. A. Togesen declared that heads of marketing departments are, and of right ought to be, vice presidential timber. Mr. Togesen, vice president, marketing, Bulldog Electric Products Co., a division, I.T.E. Circuit Breaker Co., Detroit, is head of a marketing department, and he is a vice president, too. His remarks were delivered at the American Management Association's marketing convention, and STEEL has been juggling with the idea ever since. Why shouldn't marketing heads be vice presidents? Well, you can read about it on page 38.

Although the idea was brought to STEEL's attention last February, you mustn't consider the interval unusual. It has been said that 30 years elapsed between the time Dante got the idea for his "Divine Comedy" and the time he wrote the last verse, so you see, our boys ain't so slow, after all.

Natural Interview

The gentleman beaming on our cover reflects the general condition of steel warehousing. Robert G. Welch, executive secretary of the American Steel Warehouse Association, not only permitted STEEL to use his picture on the cover: He also gave Market Editor Bill Rooney a big rundown on the situation, which appears on page 33. Rooney and Welch! Sure, Rooney couldn't have picked a more delightful assignment, nor could Welch have selected a more agreeable reporter.

Merry Christmas to All

Because this issue of STEEL, through a complicated set of astronomical and chronological circumstances, happens to appear the day before Christmas, the editors and publishers feel that the occasion warrants some official mention. Christmas Eve! The dreadful commercial rat race is over, and tomorrow, perhaps, the beautiful holiday may be seen in its true perspective.

But what can be said about Christmas that hasn't been said before? How can we be sentimental without appearing mawkish, sincere without being stuffy? Why, with verse, of course. That's why verse was invented. Let's say these are Christmas thoughts for 1956:

A wraithlike vision shimmers yet
When Christmas songs are sung
That takes us to the long ago
When we were small and young.
We see the frosted window pane,
The driving snow beyond;
The creeping drifts along the fence,
The ice across the pond.
And threading through these mental scenes
That stem from youthful times
A muted obligato weaves
Of trotting hooves and chimes;
Of wind and bells, and snapping flames,
And soughing tones of woe
That sifted down the eerie flue
Like moans from the Windigo.
We see again the spangled spruce,
That fragrant friendly tree
With all its gleaming tinsel bright
And candles burning free.
Once more we creep down creaking stairs
Behind the fading dark
And there, beneath the Christmas tree,
We find a Noah's Ark.
That wondrous Ark! With swinging doors,
A gangplank rigged beside;
The hull was bright as Spanish gold;
The hold was deep and wide.
Ah, blessed faith that fills the souls
Of children when they're young!
A faith that nestles near the heart,
And swells when bells are rung.
Oh, happy days when doubts were none,
That Ark was real and true;
It sailed the flooded seas, and rode
The wildest gales that blew.
Another Christmas Eve has swung
Through time's accustomed path
To find a world convulsed with fear
And flaming hot with wrath;
Again the silent snow descends—
Again our thoughts swing wide
To home and youth and simple faith:
The tales of Christmastide.
Those golden visions shimmer; yet
When Christmas songs are sung;
They take us to the long ago
When we were small and young.

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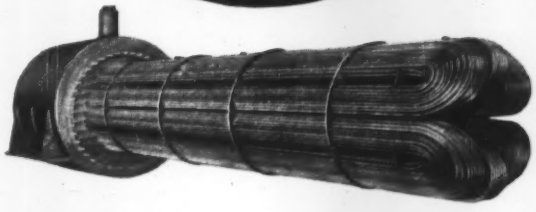
(Metalworking Outlook—Page 27)

Highest Standard in Boiler and Pressure Tubing



Every length of Standard Boiler and Pressure Tubing is tested at pressures far beyond code requirements and can be readily bent or otherwise fabricated.

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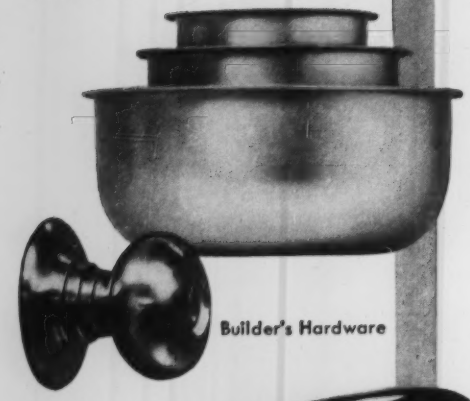
Housewares



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Look what they're designing and fabricating from the New 200 Series Stainless Steels

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Automotive Parts and Trim

Favorable reports on the fabrication of A.I.S.I. Types 201 and 202 are flowing in from manufacturers of a wide variety of stainless steel products ranging from sinks and housewares to hub caps and trailer trucks.

These reports clearly indicate that the 200 series can be fabricated on present equipment without difficulty—without any additional investment in tooling, in most cases. And possibly at savings in certain operations. In fact, skilled equipment operators—the men who work with stainless day after day—have been unable to distinguish between the 200 series and other types when they were intermixed in production runs.

The 200 series is a relatively new member of the family of Republic ENDURO® Stainless Steels. It offers high strength, corrosion-resistance, and easy formability, including draw-bench forming, roll forming, brake bending, blanking, stamping, embossing, trimming, deep and shallow drawing, welding.

Consideration of 201 and 202 for design and fabrication of your present or projected items should be based on the merits of these two types and not as alternates for other grades. However, they are being used interchangeably with other grades.

Our booklet, No 735, has the latest information on the properties, test evaluations and potentials of these new austenitic stainless steels containing 17% Cr—4% Ni—6% Mn and 18% Cr—5% Ni—8% Mn. Republic Stainless Steel metallurgists and specialists are ready to help you apply Types 201 and 202 to your production. There's no obligation. Just send the coupon to let us know if you would like a representative to call at your plant.

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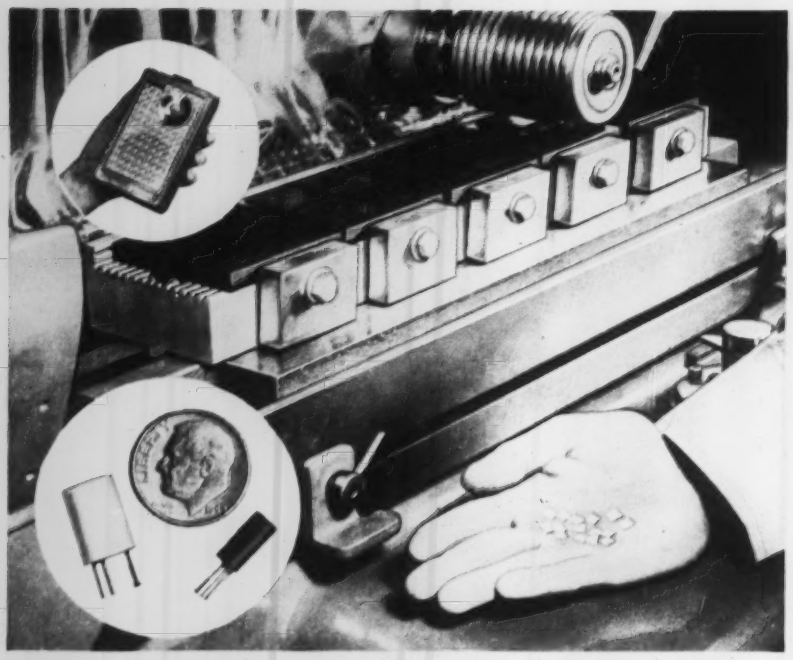


Micromatic precision slicing machine slices and dices germanium and silicon ingots into wafers for use in tiny transistors.

Tooling for the Transistor

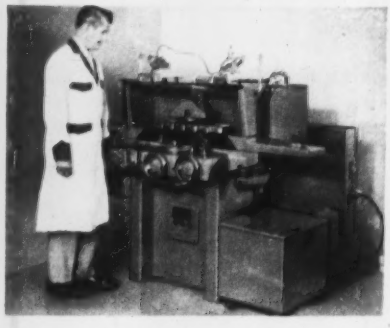
Mighty Midget of Modern Living

Vest pocket radios that run on heat . . . tiny hearing aids that defy detection . . . solar batteries charged by the sun—these are benefits of the transistor, pint-sized power house that replaces bulky "radio tubes" in many applications.

Those who preach against profit will be happy to use these remarkable products of the American economy. Yet, take away the profit and the products would remain unborn.

Production of transistors graphically portrays this economic principle. Rare germanium, costing $400 per pound, is one of the expensive metals used in wafer form for transistors. Original methods of cutting these wafers wasted half the costly germanium. The answer was a special $9,000 machine designed and produced by The DoALL Company. It slices and dices the germanium and other brittle materials at high speed with a minimum of waste.

Because manufacturers had the courage to invest in such tools, production of transistors is increasing



daily while their cost is decreasing. And, the people will soon have more new and improved electronic products at a price they can afford.

This couldn't have happened without tools. And profit is the payment to the owners for the use of their tools. Profit accounts for only about 5% of manufacturing income. Yet the tools that profits make possible do 95% of the work. No one is going to save money to invest in tools without chance of payment. A fair profit is essential to a continuously better standard of living for all.

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E-5

LETTERS
TO THE EDITORS

Springboard for Thought

Your pertinent and penetrating comments in the editorial, "Honesty in Politics" (Oct. 22, page 43), were the springboard for serious thought.

During the United Nations' diplomatic discussions at the time of the Communist invasion of South Korea, the Russian delegates, in total disregard of the truth, continually made statements which probably everyone in the assembly knew were false. It was shocking that, under the flag of diplomacy, we had to listen to total dishonesty from top responsible people.

It would be cause for deepest concern if, in our own country, we have reached a situation where our top political contestants can have the affrontery to disregard facts and honesty, continuing to make bold misleading statements based upon a totally false premise.

I hope we have seen the pendulum swing to its extreme, and that it will return to "normal." How destructive it will be if this is the building up of a trend of irresponsibility and dishonesty in high levels of our internal politics.

L. D. Miles
Manager-Value Analysis
Materials Services Department
General Electric Co.
Schenectady, N. Y.

Article Fits Traffic Problem

I would like 20 copies of the article, "Let Traffic Managers Manage" (Nov. 26, page 68). I shall soon lecture a graduate class on how to administer a traffic department. Since your article fits my topic, I would like to pass it out to the class.

K. Thomas Bryant
Taft-Peirce Mfg. Co.
Detroit

Letter to Job Shops

I read with interest your "Open Letter to Job Shops" in the Dec. 3 issue (page 79).

The complaints of job shop owners that business is rough because of the price squeeze is their own fault. The backwardness of some of these shops in adopting new ideas has put them in a hole and will keep them there. (Notice some of the better organized companies' comments that they don't have as much trouble.)

For four years, I headed the subcommittee on quality control for the technical committee of the Pressed Metal Institute. It tried its darndest

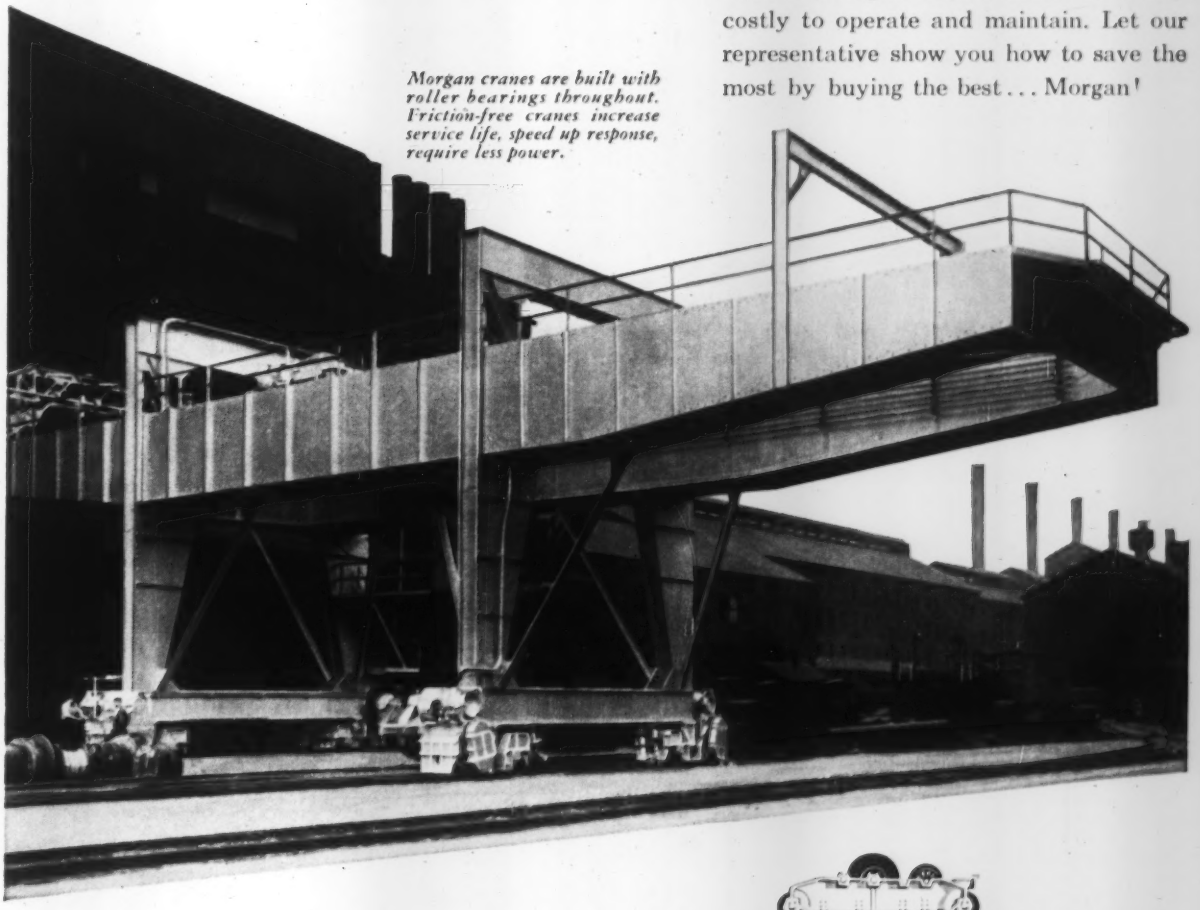
(Please turn to page 12)

How Morgan keeps cranes "rolling"

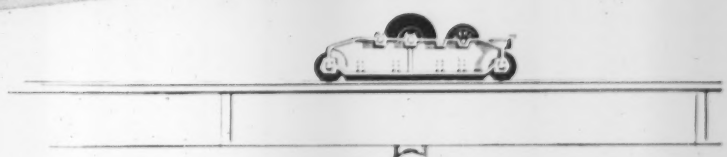
● MORGAN "Anti-Friction Engineering" keeps cranes rolling by providing precisely correct bearings and mountings for each specific application . . . your assurance of longer trouble-free operation, lower maintenance costs.

"Anti-Friction Engineering" is another vital link in the chain of features that makes Morgan cranes best in the business.

Performance records prove that advanced design and heavy-duty construction of Morgan cranes make them less costly to operate and maintain. Let our representative show you how to save the most by buying the best . . . Morgan!



Morgan cranes are built with roller bearings throughout. Friction-free cranes increase service life, speed up response, require less power.



The Morgan Engineering Company, founded in 1868, manufactures overhead electric traveling cranes, gantry cranes, charging machines, plate mills, blooming mills, structural mills, shears, saws, and auxiliary equipment.

THE MORGAN ENGINEERING CO. *Alliance, Ohio*

Ask Standard

how to cut costs with conveyors

Standard limit-switch-controlled Automatic Reciprocator is one of two used to form 200-ft. overhead detour of dehumidifier assembly line.

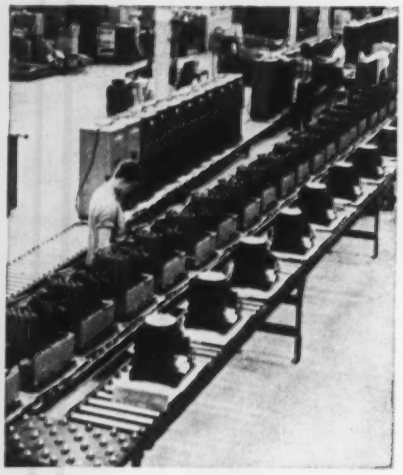
"COMPLETE CONVEYORIZING" . . . what it did in a smaller plant

Products at Ebco stay on conveyors until packaged and sent to shipping.

Ebco Manufacturing Company — employing 275 people to produce water coolers, beverage dispensers and dehumidifiers — has realized substantial savings by completely conveyorizing their operations. Ebco engineers planned for an orderly conveyor system when developing plant layout and building design; consequently conveyor system costs were kept "low" and resulting efficiency is "excellent."

Similarly, it will pay you to take another close look at your present conveyor system. Standard specialists will be pleased to help you make evaluations . . . recommend the proper equipment and its application to meet your specific needs.

STANDARD CONVEYOR COMPANY, North St. Paul 9, Minnesota. Sales and Service in Principal Cities.



Gravity roller conveyors like this, used for Ebco's assembly lines, are inexpensive, easy to set up, and economical to maintain.

For details on Standard Conveyors of all types, contact the Standard representative listed in your classified phone book or write direct. Ask for Bulletin Y-12.

Standard 50 years of conveyor experience

GRAVITY & POWER CONVEYORS

LETTERS

(Concluded from page 10)

to introduce quality control methods to job shops, but there were few takers.

Organizations like the Gray Iron Founders' Society and the Screw Machine group were quick to take advantage of this new science. I see the comment of Gray Iron in your article places quality first and doesn't seem to worry about a price squeeze.

We have written articles and spoken many times to groups of stampers who listen with a "dead ear" and say, "You can't use it in a job shop." Yet, quality control has been used successfully in many job shops to cut costs and improve quality.

Organizations like Grand Sheet Metal in Melrose Park, Ill., Hunter Pressed Steel, and a few others have made a mockery of these complaints of scrap and poor quality through modern quality control methods.

Sure, the morale of job shops is slipping. The one-man boss who wants to run everything and hasn't time for anything is quite prevalent. Quality slips and so does repeat business.

H. J. Jacobson
Quality Control Manager
Electronic Division
P. R. Mallory & Co. Inc.
Indianapolis

Use Materials Efficiently

May we have three copies of your fine article, "Write Savings Into Specs" (Nov. 26, page 116).

D. H. Blackmar
Chief Metallurgist
Le Roi Division
Westinghouse Air Brake Co.
Milwaukee

Appreciative of Efforts

The tenth article in your 1956 Program for Management, "Industry and College: Partners in Development" (Nov. 12, page 119), is informative, interesting and constructive. All of us who are devoted to the corporation-college movement are most appreciative. Thank you on behalf of America.

Frank Sparks
Action Committee
Commission on Colleges & Industry
Association of American Colleges
Indianapolis

Copies Easily Available

Please send a copy of the article, "Metalworking Tackles the Satellite" (Oct. 15, page 120). Thanks for making extra copies of this timely report so easily available.

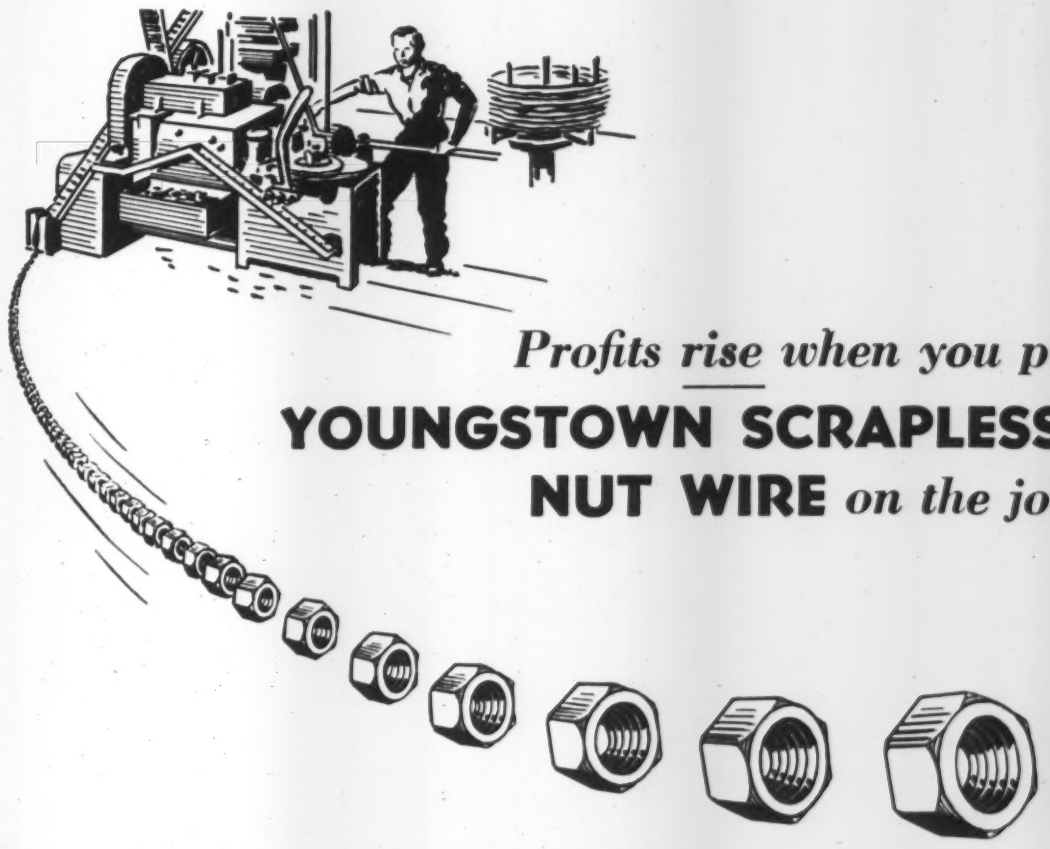
J. Moreno Jr.
Box 322
Point Comfort, Tex.

Query on Nodular Iron

Which steel companies in the East are licensed to manufacture nodular iron by the new process described in the article, "New Process for Making Nodular Iron" (Oct. 22, page 83)?

F. N. French
Manager
Lawn Mower Division
Locke Steel Chain Co.
Bridgeport, Conn.

● *We suggest you write directly to Allis-Chalmers Mfg. Co., 864 S. 70th St., Milwaukee 1, Wis., for further information. At the time the article was written, the company was working out its licensing agreement but had not licensed anyone to use the method.*



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"Production up — rejects down which increased our over-all profit." We hear this story over and over from leading cold heading operators who specify and rely on Youngstown Scrapless Nut Quality Wire. It comes to your shop free from all piping, injurious seams, laps, die marks, internal tearing and cupping, and non-metallic inclusions —all of which defects skyrocket your reject rate.

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Youngstown Scrapless Nut Quality Wire is immediately available in standard AISI as well as special resulphurized steels. Also, Cold Heading Bolt Wire, of the same high Youngstown quality, is supplied in all standard carbon analyses. Phone or write today to our nearest District Sales Office for any additional help or information.

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THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel

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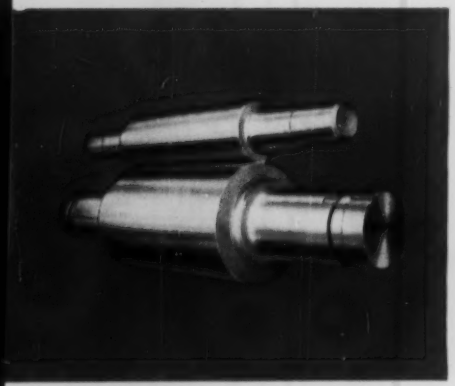
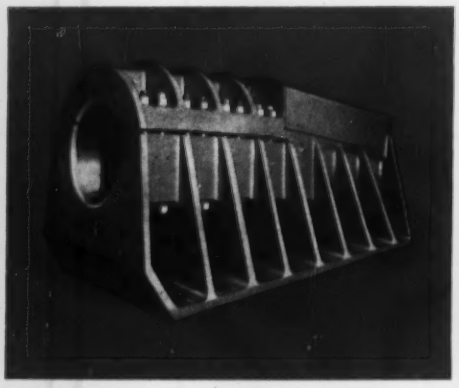
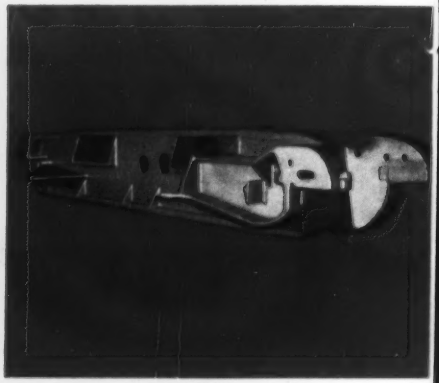
CONTINENTAL 26" x 49" x 66", 4-high reversing hot strip mill in the Newport Steel Corporation Plant, Newport, Kentucky.



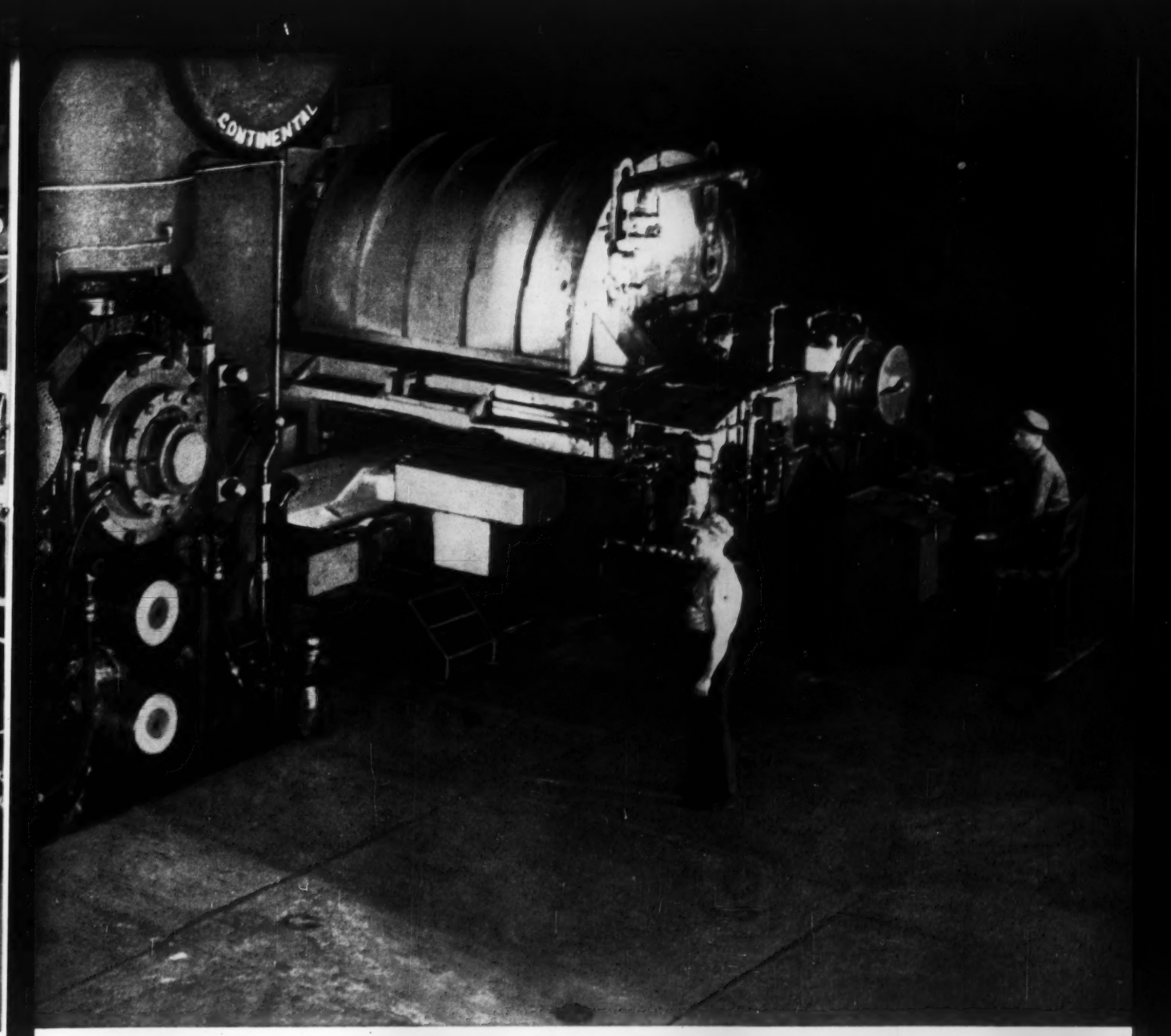
ROLLS—Iron, alloy iron and steel rolls for all types of rolling mills.



CASTINGS—carbon and alloy steel castings from 20 to 250,000 pounds.



WELDMENTS—fabricated steel plate, or cast-weld design.



BLAW-KNOX makes what it takes

to roll precision-gage hot strip directly from ingots

Precision-gage hot strip is rolled directly from ingots by this modern CONTINENTAL 66-inch 4-high reversing hot strip mill in the Newport Steel Plant at Newport, Kentucky.

A full range of gages and analyses, including carbon and special grades of steel, are rolled by this 26″ x 49″ x 66″ mill. The mill was designed to incorporate an existing 4000 hp. d.c. reversing motor through a pinion stand.

Blaw-Knox designs and builds *complete* rolling mill installations assumes undivided responsibility from preliminary engineering to satisfactory operation. At any time we'll be glad to discuss your plans with you.

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CONTINENTAL

HERE'S HELP for your tooling problems

Looking for a tool steel to do a specific job? Want to know where to buy a finishing carbide? This guide has the answers. It is a single source of information on more than a thousand different tooling materials. Knowing the job to be done, you can determine, with the guide, what product to buy and where to buy it. Cross indexes make it easy to locate tool steels and carbides by tradename, or to compile a list of sources for a single type.

40 PAGES

Copies of the Guide to Tool Steels & Carbides are available from Editorial Service, STEEL, Penton Bldg., Cleveland 13, O., at the following prices:

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11 to 50	1.90 ea.
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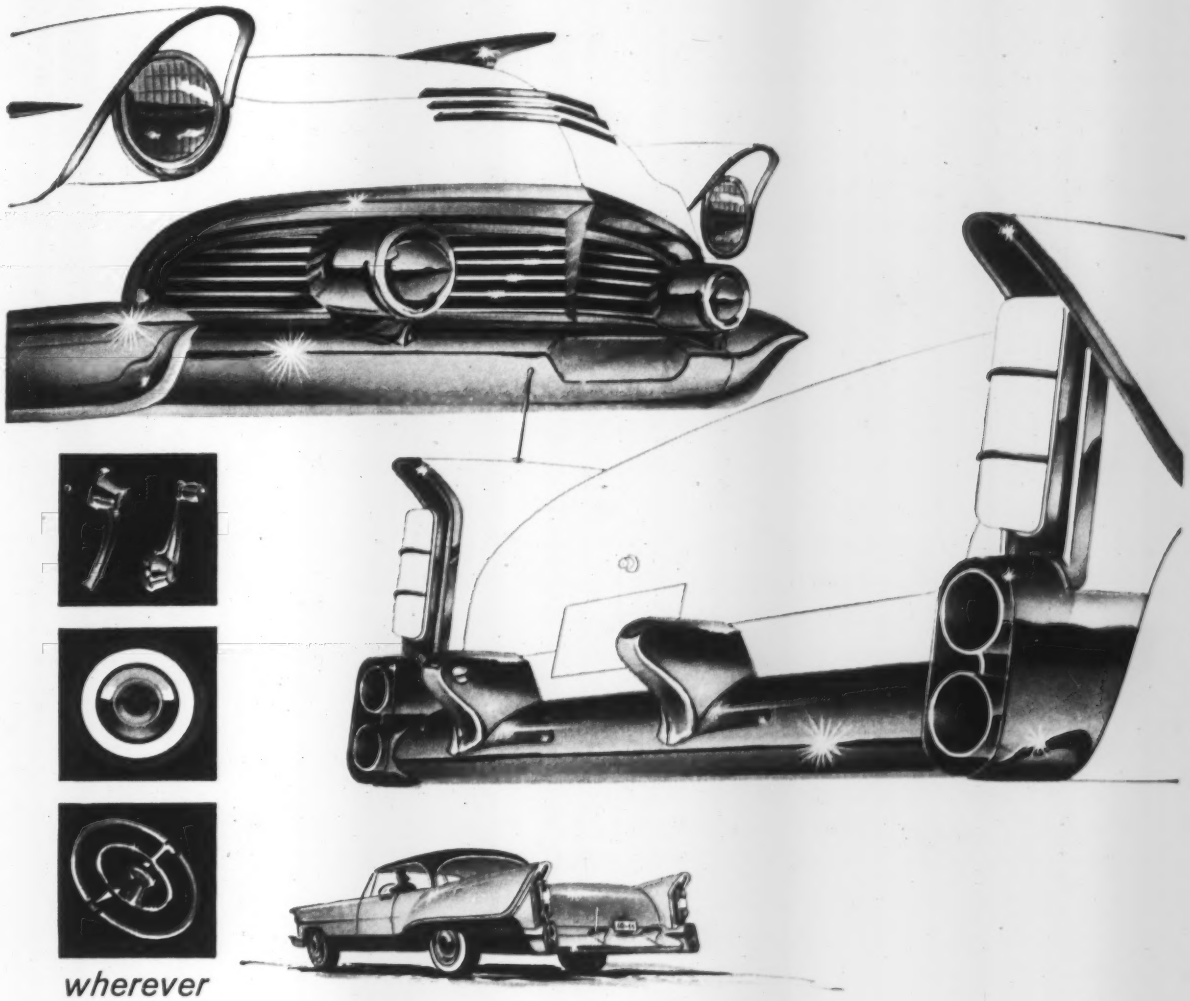

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it's a metal they know!

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You'll like stainless, too. It needs no protective coating. It helps simplify production and increases design flexibility through an unmatched combination of advantages — beauty (complemented by a wide variety of finishes), fabricating ease, remarkable structural strength, and great resistance to all weather conditions.

Let a Crucible engineer show you how stainless steel pays its way. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

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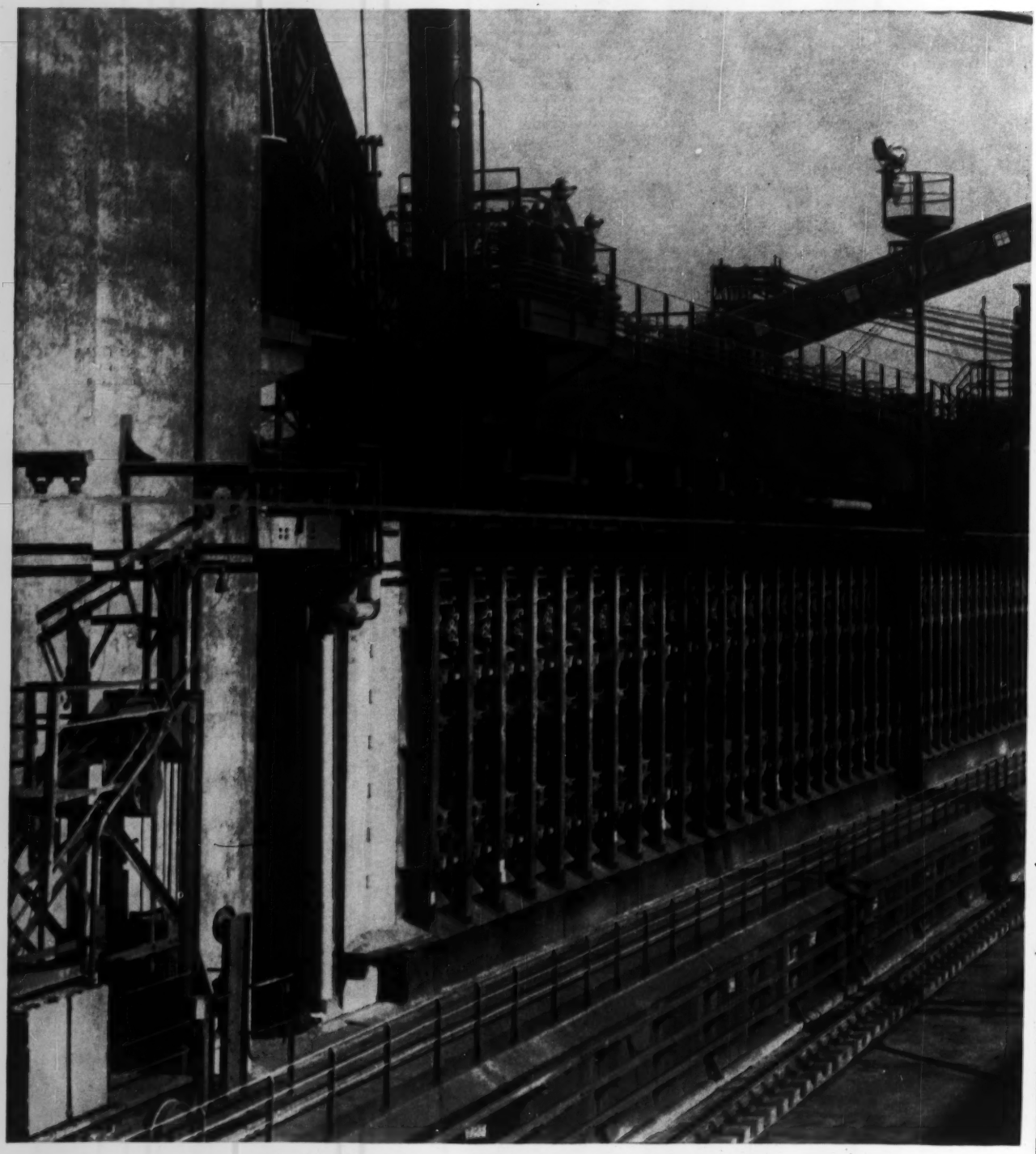
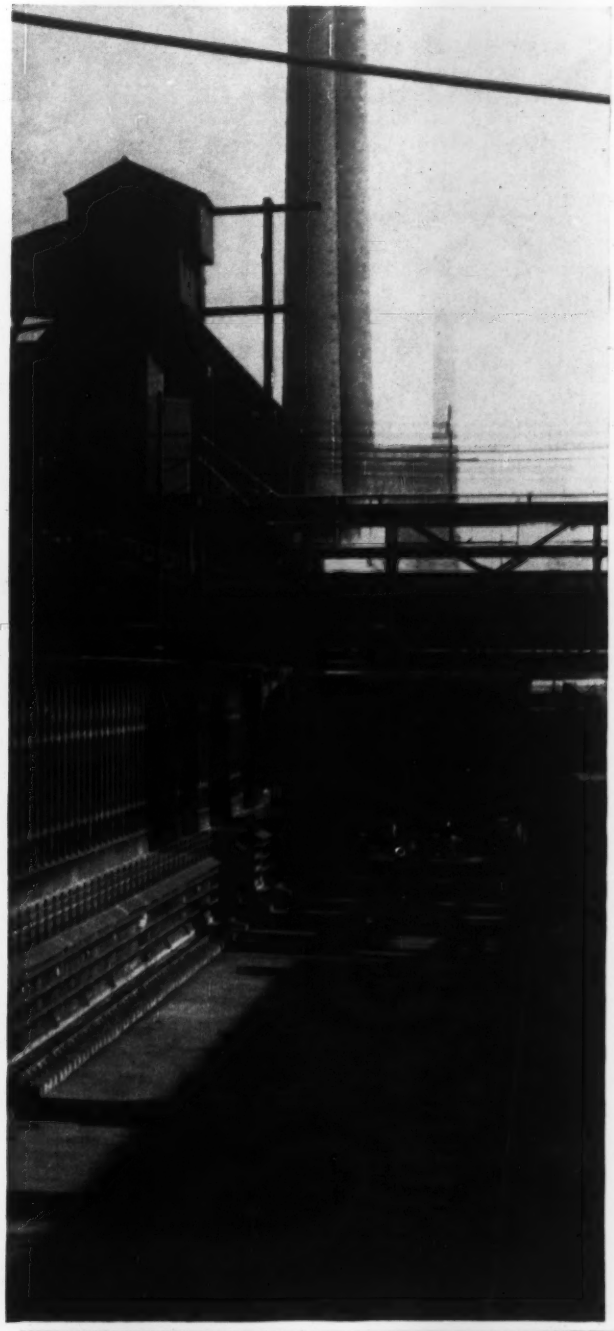
Inland Steel adds another battery



Inland Steel's new battery of 87 Koppers-Becker Underjet Coke Ovens.

# of Koppers-Becker Coke Ovens



At Inland Steel Company's Indiana Harbor Works, this new battery of 87 Koppers-Becker Coke Ovens was put into operation during October of this year, and will carbonize 1,970 net tons of coal per day.

In this battery, the low-differential Koppers-Becker Underjet Coke Ovens are underfired with coke-oven gas. However, provision has been made for future underfiring with blast-furnace gas.

Each of these coke ovens is 40 feet, 1 inch long, 12 feet high and 18¼ inches in average width, with a 3-inch taper. The oven walls incorporate Koppers patented Hammerhead Construction.

These new coke ovens are similar in design to the battery of 65 Koppers-Becker Coke Ovens constructed in 1950. In fact, this new battery is part of Inland Steel's long-range program for meeting the ever-increasing demand for steel.

Designing and constructing coke ovens is just one way in which Koppers serves the steel industry. For any kind of metallurgical construction, **you can count on Koppers.** You are invited to consult with our Engineers and Management.

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PITTSBURGH 19, PENNSYLVANIA

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ENGINEERING AND CONSTRUCTION

see w[illegible]ca's most modern power

SHEAR USERS EVERYWHERE TELL THEIR STORIES OF NIAGARA BENEFITS

(3 of 19 Photo-Reports shown in Niagara's new Bulletin 69G)

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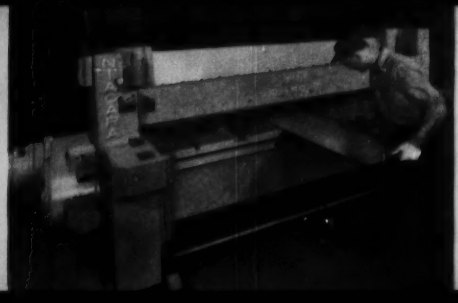
— World's Largest Trailer Mfr.



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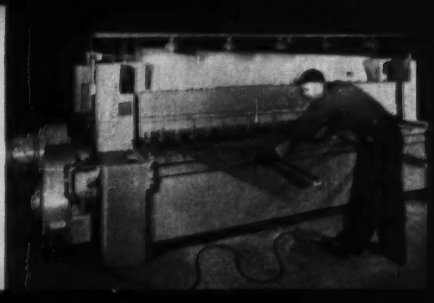

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— Midwest Road Machinery Mfr.

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Speed that spells peak productivity! Accuracy for cutting within micrometer tolerances! Ruggedness to stand the gaff on stiffest assignments! They're all yours with a Niagara Power Squaring Shear. New, fact-filled 74-page Bulletin is profusely illustrated to show you how and why:

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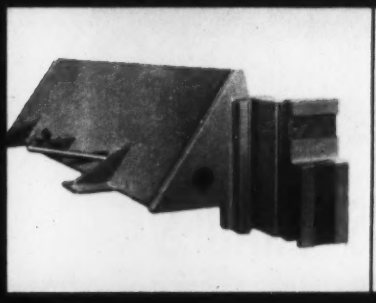
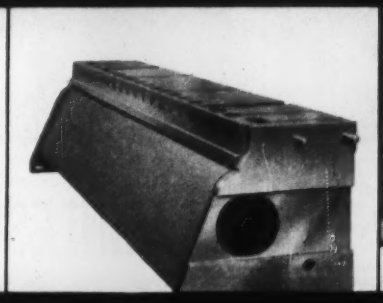
(Here's a glimpse at just a few of many. See them ALL in new Niagara Bulletin 69G)



Fully Closed Box Type Construction



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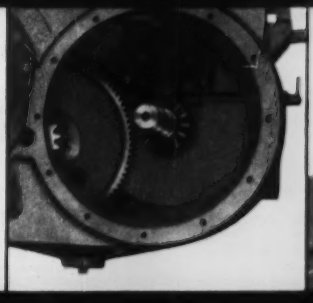

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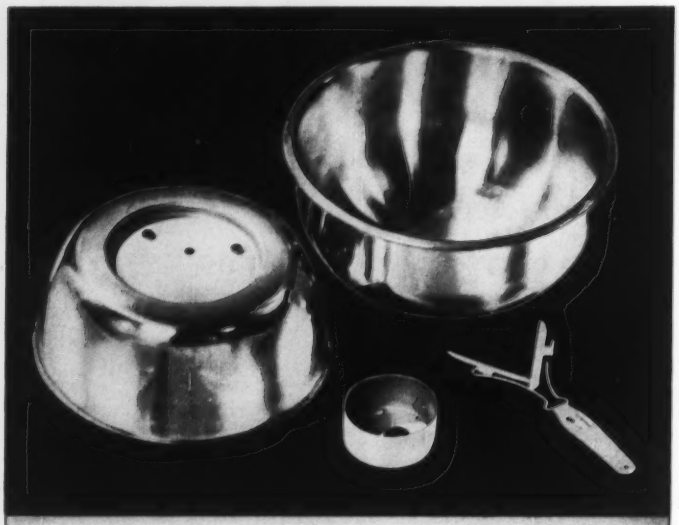
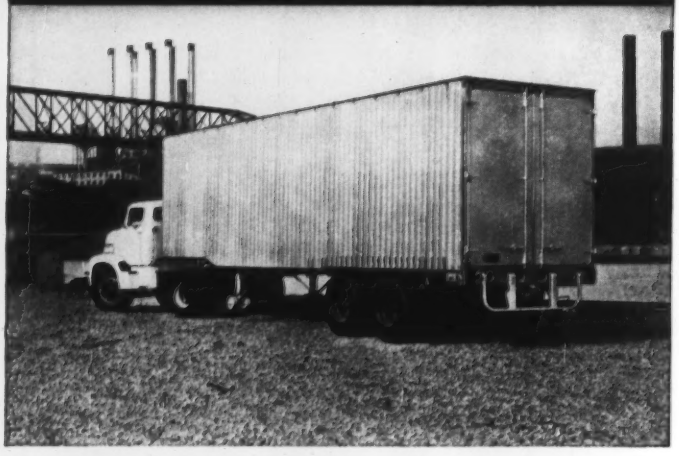
You can draw and form them LITTLE



or fabricate them BIG



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WRITE FOR THE ASSISTANCE YOU NEED

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. . . essential information on the composition, properties, fabricating methods and applications of AL chromium-manganese, low-nickel stainless steels. *Write for your copy.*

2. TEST SAMPLES

. . . We'll be glad to supply engineering assistance, and actual samples of these 200-Series steels for testing under your processes and conditions.

ADDRESS DEPT. A-841

In the top photograph, the fabrications you see are a mixing bowl, a tea-kettle base, a lock case and a patented shoe fastener: all made of A-L Type 201 or 202 chrome-manganese low-nickel stainless. The finish is good, the steel handled the same in the presses as Types 301 or 302, and similar drawing, buffing and polishing procedures were followed.

As in the lower illustration, the chrome-manganese low-nickel grades are being used also for fabrications as large as truck trailers and railroad coaches. Again, forming qualities and weldability present no problems, and results are entirely satisfactory.

Sum it all up and this is the answer: you *won't* encounter any particular differences in fabricating the 200-series of stainless steels . . . you *will* find some advantage in price, and a very important factor of much greater availability in times of nickel shortage. ● Why not take advantage of our pioneering experience with the low-nickel grades—let us help you use them. ***Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.***

WSW 6060

For Stainless Steel in ALL Forms—call

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AL® STAINLESS STEEL

CALENDAR
OF MEETINGS

Jan. 12, American Electroplaters Society: Winter meeting, Sheraton Penn hotel, Pittsburgh. Society's address: 445 Broad St., Newark 2, N. J. Secretary: John P. Nichols.

Jan. 13-16, Institute of Scrap Iron & Steel Inc.: Annual meeting, Eden Roc and Fontainebleau hotels, Miami Beach, Fla. Institute's address: 1729 H St. N.W., Washington 6, D. C. Executive vice president: E. C. Barringer.

Jan. 14-18, Society of Automotive Engineers Inc.: Annual meeting, Sheraton-Cadillac and Statler hotels, Detroit. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Jan. 16-18, American Management Association: International management conference, Roosevelt hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y. Secretary: Andrew P. Donovan.

Jan. 16-17, Caster & Floor Truck Manufacturers Association: Winter meeting, New Weston hotel, New York. Association's address: 27 E. Monroe St., Chicago 3, Ill. Secretary: H. P. Dolan.

Jan. 17-18, Steel Plate Fabricators Association: Annual meeting, Palmer House hotel, Chicago. Association's address: 79 W. Monroe St., Chicago 3, Ill. Secretary: J. Dwight Evans.

Jan. 18, Malleable Founders' Society: Semi-annual meeting, Hotel Cleveland, Cleveland. Society's address: 1800 Union Commerce Bldg., Cleveland 14, O. Managing director: Lowell D. Ryan.

Jan. 19-23, Truck-Trailer Manufacturers Association: Annual meeting, Del Coronado hotel, Coronado, Calif. Association's address: 710 Albee Bldg., Washington 5, D. C. Managing director: John B. Hulse.

Jan. 21-25, American Institute of Electrical Engineers: Winter general meeting, Hotel Statler, New York. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Jan. 21-22, Solar Furnace Symposium: Westward Ho hotel, Phoenix, Ariz. Sponsor: Association for Applied Solar Energy, 3424 N. Central Ave., Phoenix, Ariz. Secretary: John I. Yellott.

Jan. 23-24, Steel Shipping Containers Institute Inc.: Winter meeting, St. Regis hotel, New York. Institute's address: 600 Fifth Ave., New York 20, N. Y. Secretary: L. B. Miller.

Jan. 24-26, National Tool & Die Manufacturers Association: Winter meeting, Biltmore hotel, Palm Beach, Fla. Association's address: 907 Public Square Bldg., Cleveland 13, O. Executive secretary: George S. Eaton.

Jan. 28-31, Associated Equipment Distributors: Annual meeting and exhibit, Conrad Hilton hotel, Chicago. Association's address: 30 E. Cedar St., Chicago 11, Ill. Executive secretary: P. D. Hermann.

Jan. 28-31, American Management Association: West coast general management conference, Hotel Statler, Los Angeles. Association's address: 1515 Broadway, New York 36, N. Y. Secretary: Andrew P. Donovan.

Jan. 28-31, Plant Maintenance & Engineering Show & Conference: Public Auditorium, Cleveland. Information: Clapp & Poltak Inc., 341 Madison Ave., New York 17, N. Y.

Jan. 28-29, Industrial Heating Equipment Association Inc.: Annual meeting, Shoreham hotel, Washington. Association's address: Associations Bldg., Washington 6, D. C. Executive vice president: Carl L. Ipsen.

Rx for casting headaches*

Finding the proper castings often causes headaches for the purchasing, production and design men. Many have found the remedy in HAMILTON QUALITY CASTINGS.®

There are differences between foundries, and the differences can be important to you. Hamilton Foundry excels in the problem jobs . . . in castings that are hard to make because of intricate coring, thin metal sections, tight dimensional tolerances or high physical specifications. We take these jobs and consistently "make them right" . . . on time.

Our specialties are light and medium castings in Gray Iron, Alloyed Iron, Meehanite, Ni-Resist and Ni-Hard.

Why not let us relieve your casting headaches?

A 'phone call or letter will bring prompt assistance. Better still, send us the drawing with casting weight and a description of the pattern equipment. We'll be glad to prescribe for that "casting headache"

P.S. The above "headache casting", a pump body, was made in Meehanite, casting weight 3.87 lbs. Cored passages and sections ranging from 11/32" to 2 1/16" made this casting a tough one.

GRAY IRON • ALLOYED IRON
MEEHANITE • NI-RESIST • NI-HARD

THE HAMILTON FOUNDRY
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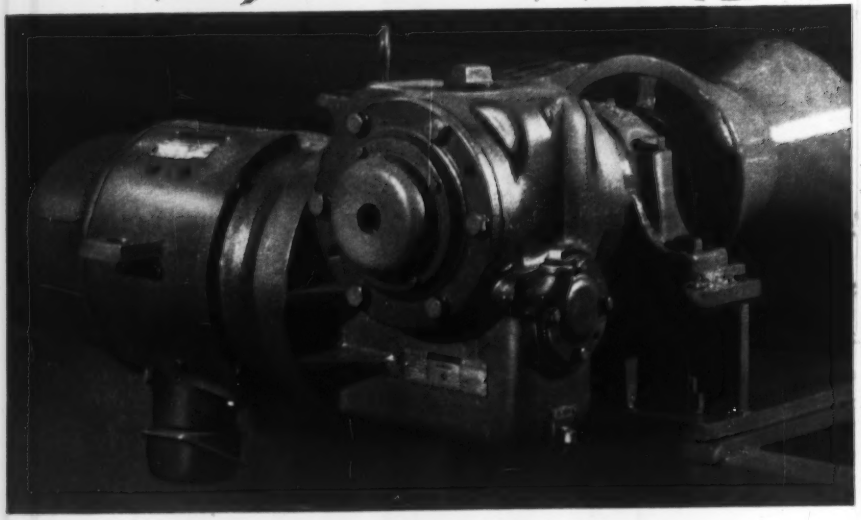
1551 Lincoln Avenue • Hamilton, Ohio
Phone TWinbrook 5-7491

MS6-2

Seamless tube delivery gets **Triple protection in**



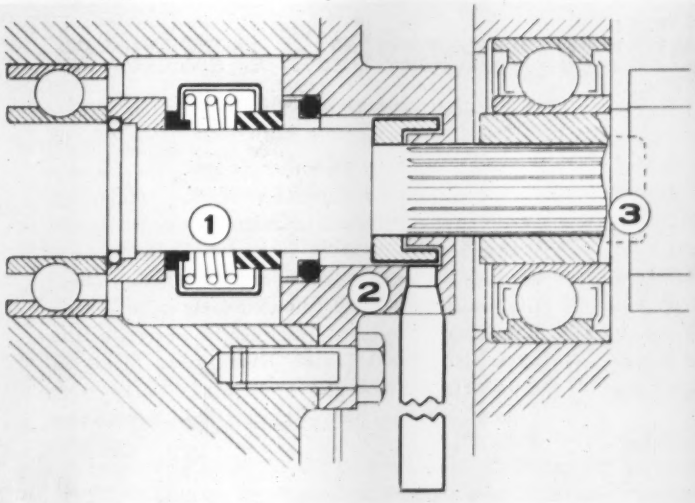
Westinghouse floating gearmotors

Westinghouse floating shaft gearmotors have undergone the critical tests of 24-hour-a-day, run-out table operations. Typical results come from a seamless tube drawing, tempering and annealing operation. Here, Westinghouse units bring three-way protection against the always-present problems of oil leakage and motor changes.

Two separate seal systems guard against oil leaking from the gear unit into the motor. An indicating feature warns of seal wear, before failure, in time for preventive maintenance.

Westinghouse splined shaft coupling permits easy separation of motor and gear assembly in seconds. Valuable inspection time is saved and motor changes can be made on the job, reducing down time.

Shock-absorbing spring mounting and rugged construction make Westinghouse floating-shaft gearmotors extremely tough . . . but why not see for yourself in Booklet B-6370. Call your local Westinghouse sales engineer for a copy, or write Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa. J-07354



1. A combination labyrinth-packing and face-type seal on the pinion shaft prevents oil leakage from the gear housing into the motor.

2. For added protection an umbrella seal and drain catches any leakage through a worn shaft seal. Visual indication of seal wear is given by the drain.

3. The simple spline connection between motor and gear shafts permits fast demounting of the motor without disturbing gears or bearings.

YOU CAN BE SURE... IF IT'S Westinghouse

Keep 'em rolling with Texaco

YOU'LL consistently get high-rate, uninterrupted production from your roll stands when *Texaco Regal Oil* goes into the circulating systems.

Texaco Regal Oil has exceptional resistance to oxidation, emulsification and sludging. It keeps lines clear for a free flow of lubricant, keeps oil film bearings clean and fully protected, keeps bearing temperatures normal even under extra-heavy loads. Naturally, rolling efficiency goes up, unit costs come down.

To keep enclosed reduction gears and their bearings running smoother longer, use *Texaco Meropa Lubricant*. It resists oxidation, thickening and foaming, stays stable under extreme pressures.

Put Texaco to work in your mill and enjoy dependable, economical operation through effective lubrication. Get full details from a Texaco Lubrication Engineer. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N.Y.

TEXACO

TEXACO Lubricants, Fuels and Lubrication Engineering Service

$1 Billion Coming in Automatic Wage Hikes

Some 5 million workers will get pay raises totaling $1 billion in 1957 as a result of contracts negotiated in earlier years. Of more than 550 major agreements in effect that grant deferred increases, 350 settlements were made in 1956; the others were agreed to earlier, mostly in 1955. About 90 per cent of the workers scheduled to receive deferred increases in 1957 will get 5 to 11 cents more per hour. Most of the people affected are in auto, farm equipment, aircraft, electrical, steel, aluminum, other nonferrous, construction, transportation, food and mining industries. Part of the pay boosts next year will come because of escalator contracts. An estimated 3.8 million employees are covered.

Some 60,000 Engineers Unionized

Some 60,000 of the nation's 500,000 professional engineers hold union cards, reports the National Industrial Conference Board. It says: "While these figures show that engineers are far from constituting a unionized segment of the economy, they do indicate possible dissatisfaction among this group." Discontent over salaries and professional status and the disappearance of individual relations between engineers and their employers are cited as principal causes of the gains in unionization. The median salary for engineers with ten years' experience was estimated at $7850 a year, double the 1929 figure. But average earnings of production workers have tripled in the period.

Sales Hot for Air Conditioning

The air conditioning industry will have retail sales of $5 billion in 1961, compared with nearly $3.2 billion in 1956, predicts Cloud Wampler, Carrier Corp.'s chairman. He predicts these 1957 sales figures (1956's are in parentheses): Room air conditioners—$440 million ($426 million), self-contained equipment—$238 million ($215 million), residential systems—$375 million ($262 million), applied or "built-up" systems—$1190 million ($1048 million), heating installations adaptable to air conditioning—$650 million ($638 million), all other—$600 million ($575 million), total—$3.5 billion ($3.2 billion).

Prospects for Titanium

Look for 23 million lb of titanium mill products to be delivered in 1957, compared with 10.6 million in 1956. Shipment value next year will exceed $200 million, compared with $130 million this year, estimates T. W. Lippert, Titanium Metals Corp. of America. Sponge production next year will be from 50 million to 56 million lb, compared with 20 million in 1956. Four melters and processors of titanium metal—TMCA, Rem-Cru Titanium Inc., Mallory-Sharon Titanium Corp. and Republic Steel Corp.—were joined

by two newcomers in 1956—Oregon Metallurgical Corp., Albany, Oreg., and Harvey Machine Co. Inc., Torrance, Calif.

Gains in Uranium

Some 6000 tons of uranium concentrate will be produced in the U.S. this year. Output has climbed from 1600 tons in the second half of 1955 to 2600 tons in the first half of this year to 3400 tons in the second half. In the country, 12 mills operate with a capacity to process 8960 tons per day. Eight more will be built for operation in 1957 or early 1958. They'll be able to handle 4025 tons of ore per day.

Ore Shipping Season Ends

Four vessels of U.S. Steel Corp.'s Pittsburgh Steamship Division left the upper lakes on Dec. 19 with the last ore of the season. They break a 57-year fleet record for late closing of the shipping season.

Bendix Aviation Buys Sheffield Corp.

Another important merger occurred last week. Bendix Aviation Corp. contracted to buy assets of Sheffield Corp., Dayton, O., maker of precision measuring instruments with annual sales of about $24 million. Sheffield is privately owned.

Rubber Sales Up $1 Billion by 1960

Increased auto sales next year will boost the sale of car and truck tires, plus such rubber products as foam rubber, seals, gaskets, hose and mountings. Use of air springs in 1957 cars will be small, says H. E. Humphreys Jr., president, United States Rubber Co., but by 1958 their use will be widespread. He predicts record rubber industry sales of $6 billion next year, and an annual rate of $7 billion by 1960. U.S. Rubber will invest a record $40 million next year in expansion and modernization.

Railroads Get 7 Per Cent Freight Hike

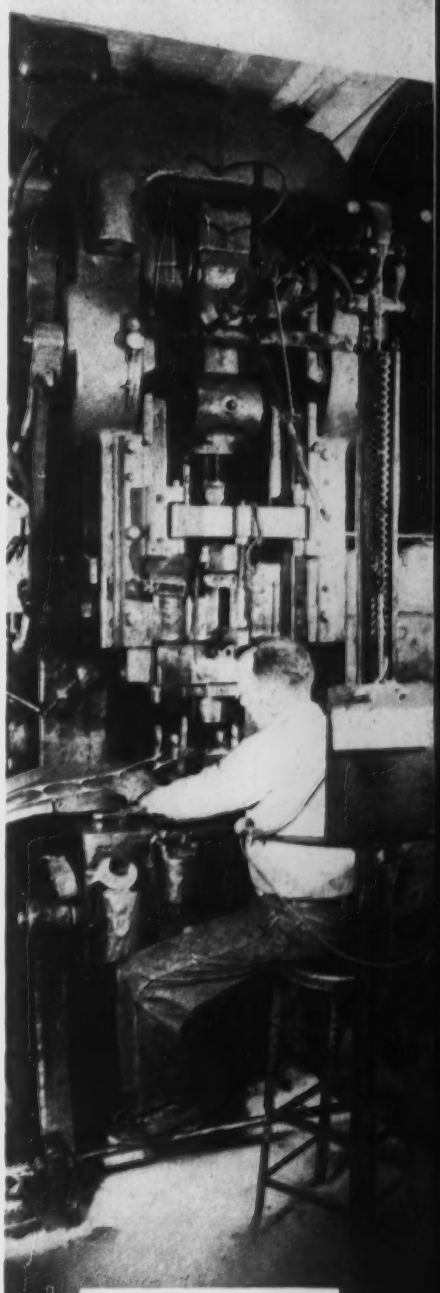
It's pretty definite that the railroads want a 22-cent increase in freight rates, although the Interstate Commerce Commission hasn't made up its mind whether the railroads officially have requested an additional 15 per cent to the 7 per cent granted last week, or 15 per cent over-all. Last week's emergency increase of 7 per cent in the eastern territory, 5 per cent in the western and 5 per cent between eastern, western and southern territories, will mean an extra $402 million annually to the railroads. A hearing on the general increase of 15 per cent is scheduled for Jan. 15-24. Southern roads' request for 7 per cent will be heard Jan. 7.

Straws in the Wind

Columbia-Geneva Steel Division, U.S. Steel Corp., is studying the chances of developing low-grade iron ore deposits in Fremont county, Wyo. . . . General Electric Co. is actively recruiting women (with college degrees and at least a minor in mathematics) to be engineering assistants . . . Dr. H. A. Leedy, director, Armour Research Foundation, says the average business whose success depends upon technological developments should spend 5 per cent of its sales on research.

pre-planned

results



In estimating production costs, one of the items a metal fabricator takes into account is the cost of steel. As important as this is, it is sometimes good economics to pay more for steel, but pay less in the end for the fabricated part. The cost of down time on expensive forming equipment, the cost of idle labor, the cost of reprocessing defective parts, may well exceed the cost of the extras built into restricted specification steel, which will eliminate these unplanned-for costs.

CMP restricted specification cold rolled strip steel can be pre-planned to minimize production delays and produce for you the production cost you need. We will welcome the opportunity to explore with you the cost-saving potentials in your manufacturing processes which may be available to you by use of **CMP** restricted specification cold rolled strip steel.

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RESTRICTED SPECIFICATION COLD ROLLED STRIP STEEL boosts production, stops slow-downs, reduces die costs, meets feed and speed requirements of automatic equipment.

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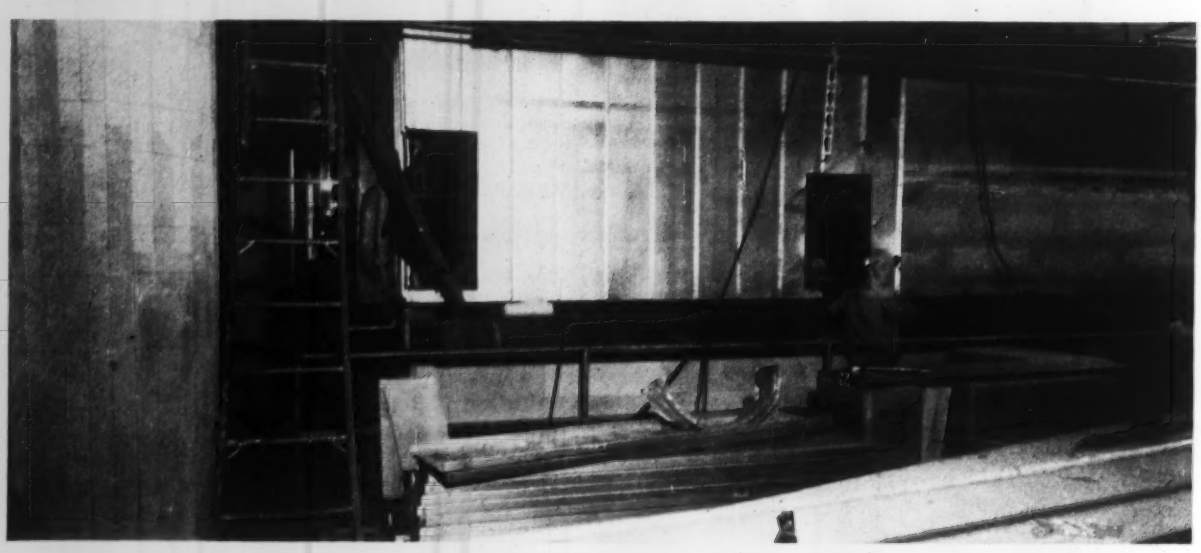
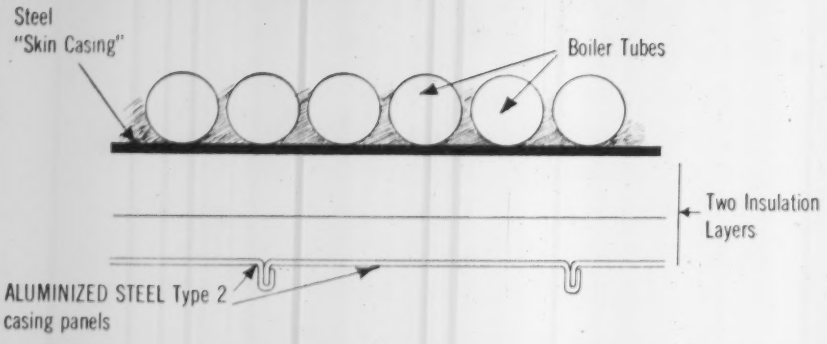
STRIP PROVIDES the precision dimensional and physical qualities that solve many fabrication, cost and performance problems.

C·M·P

New Armco ALUMINIZED STEEL Type 2 protects giant boilers





Interlocking panels made of Armco ALUMINIZED STEEL Type 2 make up an easily-erected, low maintenance outer covering for this boiler. Between this covering and the sheet metal "skin casings" next to boiler tubes are two layers of insulation.

Casings for the big boilers and duct work at Detroit Edison's River Rouge Power Plant must be damage-resistant and easy to maintain. That's why Armco ALUMINIZED STEEL® Type 2 was specified for these casing panels.

Maintenance men at the plant say non-metallic casings are more easily damaged and create "housekeeping" problems in installation and maintenance. In contrast, strong, easily-erected panels of Armco ALUMINIZED STEEL Type 2 not only resist damage but stay attractive with little or no upkeep. The patented hot-dip aluminum coating on this special steel resists corrosion—makes painting unnecessary.

what 17-year tests show

Seventeen years of testing in an industrial atmosphere show this about the corrosion resistance of Armco ALUMINIZED STEEL Type 2: *The life of the aluminum coating in atmospheric service is at least three times that of a standard zinc coating on galvanized steel sheets.* (The steel was tested 15 years before it was produced commercially.)

Wherever you need a sheet steel for atmospheric service, it will pay you to consider ALUMINIZED STEEL Type 2. For more information about this newest Armco Special-Purpose Steel, just write us at the address below.

ARMCO STEEL CORPORATION

2446 Curtis Street, Middletown, Ohio

Sheffield Steel Division • Armco Drainage & Metal Products, Inc. • The Armco International Corporation

As we look around us in a troubled world, this holiday season is an especially appropriate time to count the blessings of living in a country where individual freedom and opportunity are recognized as inalienable rights.

In counting these blessings, may we, on behalf of the staff of STEEL wish you a

MERRY CHRISTMAS

AND

A HAPPY NEW YEAR

Irwin H. Such
EDITOR-IN-CHIEF

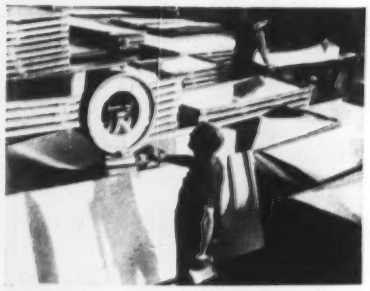
BUYERS GUIDE TO STAINLESS

A Directory of Ryerson Stainless Steels and Services

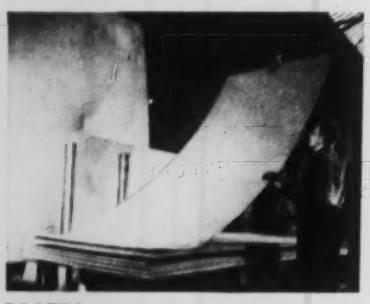
Here's a quick guide to the nation's largest stocks of stainless steel—2,351 sizes, shapes, types and finishes of Allegheny stainless in stock at Ryerson.

This wide selection assures you of getting the best stainless for every application. Extra care in storage, handling and shipping—such as padded shear clamps to protect finish and flatness of sheets—guards the high quality of Ryerson stainless stocks. And in addition, the help of full-time stainless specialists is yours when you call Ryerson.

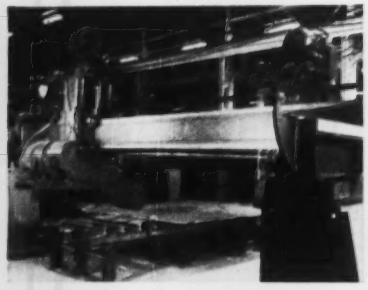
See your Ryerson catalog for a complete listing of stocks and call your nearby Ryerson plant for quick shipment of Allegheny stainless—one piece or a truckload.



SHEETS—11 analyses of Allegheny stainless sheets in stock including nickel and straight chrome types. Also extra wide sheets to reduce welding costs.

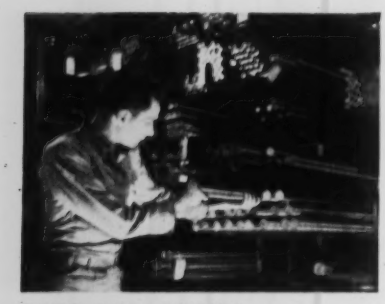


PLATES—Available in 9 analyses including plates to Atomic Energy Commission requirements and to ASTM specifications for code work. Also extra low carbon types for trouble-free welding.



TRUE-SQUARE DISC CUTTING—Stainless plates up to 12' x 25' cut absolutely square on abrasive disc machine. Length and width tolerance plus or minus 1/32".

A NEW STEEL—Type 202 Allegheny Stainless is available in 14 to 26 gauge sheets. Type 202 compares favorably with 302 in corrosion resistance; costs 2¼¢ per lb. less.



BARS AND ANGLES—Rounds, squares, flats, hex's and angles in 8 types including free-machining bars with both analysis and mechanical properties controlled for best performance.

CIRCLES, RINGS, SPECIAL SHAPES—Practically any shape, no matter how intricate, can be accurately flame cut from stainless steel plate by skilled Ryerson operators.

PIPE AND TUBING—Light wall, standard and extra heavy pipe, ornamental and regular stainless tubing. Also flanged, screwed, welding and Quikuple fittings and Cooper stainless valves.

AIRCRAFT STAINLESS—Sheets, strip, plate and bars to Government and Aeronautical Specs. Write for Ryerson Aircraft Steels booklet.

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JOSEPH T. RYERSON & SON, INC. PLANTS: NEW YORK • BOSTON • WALLINGFORD, CONN. PHILADELPHIA • CLEVELAND • CHARLOTTE • CINCINNATI • DETROIT • PITTSBURGH • BUFFALO CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Distributors' Welch sees 30-million-ton volume by '71 as . . .

Steel Warehouses Hold Pace

SOME 17 million net tons of finished steel moved into consumption through warehouses in 1956.

In addition, millions of pounds of aluminum and other nonferrous metals reached consumers through the hundreds of steel-metal service centers that dot the industrial map of the nation.

Big Tonnage—By 1970-71, says Bob Welch, executive secretary, American Steel Warehouse Association, Cleveland, steel volume of distributors should exceed 30 million tons—even if they do no more than hold their present ratio (20 per cent) of the total produced. His estimate is based on projected steel expansion of 4 million to 5 million ingot tons annually for the next 15 years. By 1971, he thinks, warehouse distribution will be 75 per cent higher than it was in 1956—easily in step with the projected growth in finished steel capacity to about 150 million net tons (200 million ingot tons).

In 1956, warehouse-distributed steel will involve more tonnage than was produced annually by all U. S. mills from 1931 through 1934. The figure will surpass the 1956 output in all but three foreign countries — Soviet Russia, Great Britain and Western Germany.

Tops Steel — Warehouse shipments this year (3.1 million tons) are nearly six times the tonnage distributed in 1926. In the same period, mill shipments didn't quite triple, rising from 29.6 million to an estimated 84 million tons this year. Over the last 15 years, distributor volume rose 85 per cent, mill shipments only about 40 per cent.

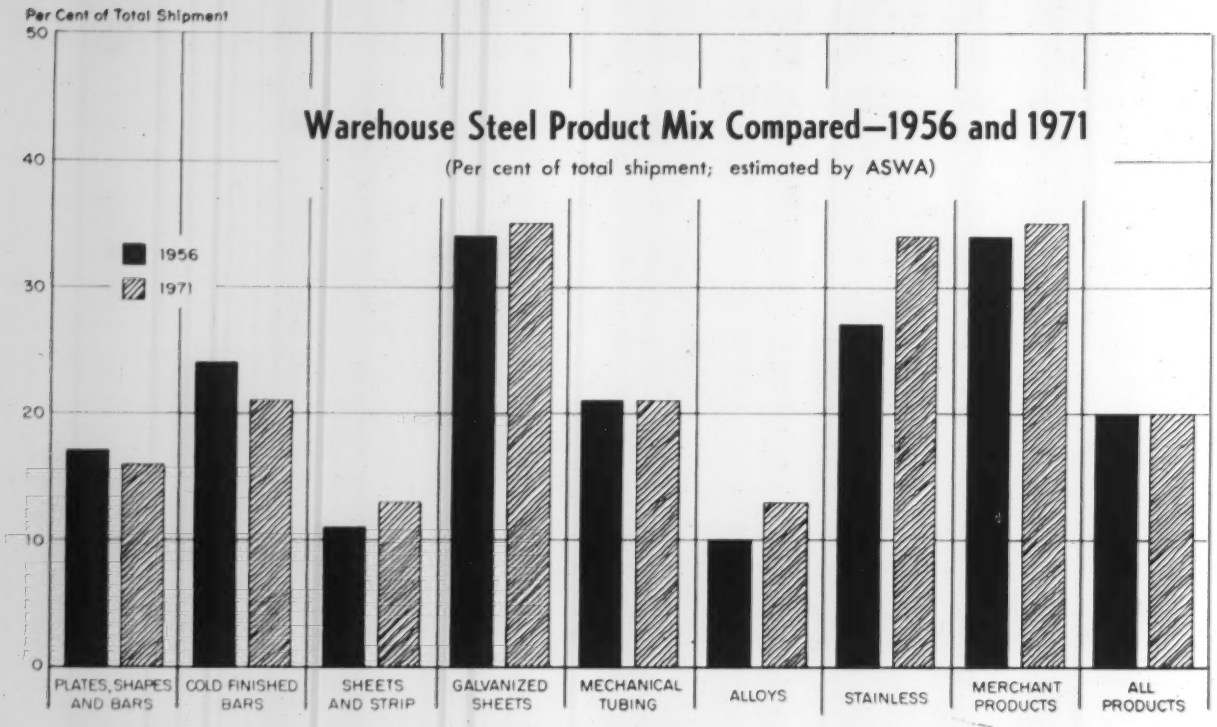
Other evidences of warehouse gains: The variety of steel products offered is greater than it was 15 or 30 years ago; more nonferrous metals are being stocked; services, such as shearing, cutting, sawing, burning, slitting and leveling, are broader; and the number of distributing plants has increased.

Fivefold Gain — Membership in the national trade association has increased fivefold since 1935. This group now boasts 507 member companies operating 853 warehouses in 45 states, Canada and the Hawaiian Islands. More than half the members are in centers which previously did not have local warehouse service.

If hardware stores and other small vendors are taken into consideration, the number of steel distributors runs into many thousands. Well over 12,000 stores specialize in merchant products, such as wire, fencing, nails, staples, screening, fasteners and standard pipe. These sellers account for 25 per cent of steel warehouse volume.

Another 25 per cent is represented by firms concentrating on the distribution of oil country goods. A third, and the most important segment of the industry, consists of some 2000 warehouses which handle industrial products like plates, shapes, bars and sheets. These stores account for about 50 per cent of the distributor load. On a combined basis, they normally carry 3 million tons of steel in inventory.

Among Small—Essentially, the steel warehouse is a small business. But the industry's sales exceed $3 billion annually. There are a few large national chains, but the industry is composed largely of medium-sized firms. In 1955, fewer



than 10 per cent had annual sales of over $3 million. About 60 per cent had a volume under $1 million.

Plants run from 10,000 to over 1 million sq ft. In a normal year, the industry processes 25 million to 35 million separate orders from literally hundreds of thousands of customers—15 to 20 times the number served directly by the mills.

Everyone is a potential customer. The do-it-yourselfer or the tank fabricator generally can get his order filled quickly at a warehouse in his locality.

Large users buy most of their requirements direct from the mills, but 90 per cent of all consumers rely on distributors for all their needs. Even the remaining 10 per cent obtain a portion of their steel from warehouses — for maintenance, small production requirements and emergency purposes.

Small Lots — The average warehouse order amounts to no more than 1000 lb. The average mill order ranges from 40 to 50 tons.

Some warehousemen think that, eventually, more warehouse orders will be in lots of 5, 10, and 15 tons —based on the expectation that the size of orders will rise as the producers find that the servicing of smaller lots (5 to 15 tons) is uneconomical on the new high-speed, big-volume rolling mill installations. If that happens, warehouses will have to carry larger inventories, necessitating larger facilities and improved handling and processing equipment.

Little Change — The physical complexion of warehousing won't change much over the next decade and a half. New installations, for the most part, will be in the outskirts of urban centers.

Warehouse product mix is likely to change over the next 15 years (see accompanying chart). In heavy products, the percentage take may be off a little, but it will be up in the lighter items, and will be noticeably larger in the specialties and alloy steels, such as stainless.

Mechanization — Over the last 20 years, much progress has been made in the mechanization of the warehouse. But automation hasn't made much headway in the industry. Constantly rising costs and shortages of efficient labor will make increased use of mechanization and automation a must.

Greater mechanization provides the only defense against constantly rising costs, says C. L. Hardy, president, Joseph T. Ryerson & Son Inc., Chicago, one of the country's largest warehousing chains.

Extending this thought to the volume of business likely to be done over coming years, Marcus J. Aurelius, vice president and general manager of sales, U.S. Steel Corp., recently said the warehouse share of steel volume "assuredly will grow if distributors' methods evolve to the point where they are geared to the new order of the times."

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.

Taylor-Winfield Adds Facilities

T. S. Long, vice president, Taylor-Winfield Corp., Warren, O., says the company's $500,000 expansion will be finished Jan. 1.

It includes $204,000 for adding about 30,000 sq ft of manufacturing space and $340,000 for new equipment.

More Steel Expansion Plans

Phoenix will build an integrated mill. Granite City reveals 1960 projects. Fast tax amortization bids by Bethlehem, Sharon, Lone Star push industry requests to $2.2 billion

STEEL took the expansion headlines last week.

Phoenix—Barium Steel Corp.'s Phoenix Iron & Steel Co., Phoenixville, Pa., plans to build a fully integrated steel mill in southern New Jersey on a step-by-step basis. Being considered is an initial plan to erect an 800,000-ton plant to produce steel by oxygen blown methods which do not require open hearths. Included will be coke ovens and a blast furnace to make pig iron. Phoenix's vice president, W. A. Cook, says:

"We are still in the preliminary stage of design." He stresses that "no time schedule" has been worked out, but construction will take place "over a period of years." He also states that the company has not "discussed what the total cost of the plant will be." That will await completion of a full engineering survey.

The mill will be constructed on a 1000-acre site on the Delaware river between Trenton and Camden, which was purchased from the Pennsylvania Railroad.

Granite City—John N. Marshall, chairman and chief executive officer, Granite City Steel Co., Granite City, Ill., says the company is discussing plans for a $150-million program to raise its steelmaking capacity to about 2.5 million ingot tons a year. The plan is tentatively scheduled to start in 1960.

The company's present $30-million expansion will be finished in 1958. This plan will boost ingot capacity to about 1,584,000 tons a year.

Mr. Marshall says the company will ask for a fast tax write-off on the 1960 plan. Financing, he says, will probably include the sale of common stock and bonds.

Tax Am—New applications for fast tax amortization by Bethlehem, Sharon Steel and Lone Star Steel bring the total filed by the steel industry since July to $2,157,607,645. At present, the industry is not eligible for the write-offs. The requests have been filed in hope of a favorable decision by the U.S. on a study now under way to see if mobilization requirements warrant the aid. Look for a decision in mid-January.

Bethlehem — Bethlehem Steel Corp.'s tax am requests are for projects at Lackawanna, N. Y., and Steelton, Pa.

The Lackawanna expansion would boost capacity to 7.1 million tons a year. (The plant is in the final stages of an expansion which is boosting capacity to 6 million tons.)

Additional capacity planned includes: 575,000 net tons of sheared steel plates, 575,000 tons of structurals (including wide flanged shapes) and 24,000 tons of steel piling a year. The over-all increase is figured at 1.1 million tons, although individual additions total 1,174,000 tons. The explanation is that not all new units would be operating at the same time.

The Steelton project would cost $6,585,000 and expand rolling mill facilities.

Sharon—Sharon Steel Co., Sharon, Pa., has asked the ODM for tax help on a $22,050,000 expansion at Farrell, Pa.

Of this amount, $14 million represents a resubmitted application for blooming mill facilities now nearing completion. The additional application is for electric furnace facilities estimated to cost $8,050,000.

Lone Star — Lone Star Steel Co. filed an application for fast tax amortization on $7,805,645 worth of expansion of its steel tube facilities at Lone Star, Tex.

The ODM recently granted a certificate for fast tax amortization to Republic Steel Corp., Massillon, O. It's for a $2.4-million by-product coke project.

The Merger . . .

CONGRESSIONAL Small Business Committee spokesmen are already barking at the proposed Bethlehem-Youngstown merger.

Sen. John Sparkman (Dem., Ala.) slammed it as: "The most serious threat of the decade to our competitive, free-enterprise economy. A blow at the jugular vein of anti-trust enforcement." He will reintroduce antimerger proposals as soon as Congress reconvenes.

Talk around Washington is that it will take at least a year for a preliminary decision in the case, perhaps two years for the final outcome. Most optimistic Justice department guesses are that 16 months will elapse between now and the time of the final ruling by the supreme court. (The loser in the district court is certain to appeal to the supreme court.) The U.S. is as anxious for speed as the companies because the case will set precedent regarding Section 7 of the Clayton Act as amended in 1950.

Neither Bethlehem nor Youngstown will make any physical move toward merging pending the final court decision. Each will proceed with planned expansion programs.

Do sites like this limestone mine at Huntsville, Ala., mean . . .

Plants Going Underground?

SEVERAL companies have shown interest in underground plant sites at Huntsville, Ala., since the American Machine & Foundry Co. took title to 2600 acres of Green mountain there. Conversation in Huntsville has it that one of these companies is Avco Mfg. Co., New York.

While AMF, whose headquarters are in New York, obtained title about four months ago, no development work has been started on the site, which is 10 miles south of Huntsville.

Big Hill—Green mountain, 1000 ft high, is a part of a long, flat-topped limestone ridge near the Alabama-Tennessee border. One part of this ridge — Monte Sano mountain—was hollowed out for its limestone in the last year or two (see photo).

The structure of these mountains makes them good for underground rooms. The limestone is in level layers, and when it is removed, the floors and ceilings are smooth and horizontal. Water does not penetrate the rock, so there is no problem of humidity or drainage. The temperature is constantly around 60 degrees.

Cushioned—The limestone ridge is covered with 80 ft of sand and shale, which would act as a cushion in event a bomb were dropped on it. Dynamite test blasts atop the mountain proved that. Seismographs at strategic points around Green mountain recorded only one-seventh as much shock as had been expected. Part of the cost of burrowing into the mountain would be offset by the sale of the limestone mined.

It's believed that any underground plants built in the Huntsville area will have the federal government as an interested party. The government would like to see some built.

Significance?—It wasn't possible to determine what significance the Green mountain location has to its big neighbor—Redstone Arsenal, a control center for development and procurement for the Army's guided missiles and rockets.

Some of the Defense department people are becoming disenchanted with the idea of underground plants. They think that in the atomic age, dispersal is just about as effective a defense as a hole in the ground.

Good for Depots—Some of the people in Washington say the only place you can make out economically underground is on storage depot construction. If an existing mine were used, facilities could be set up for about 80 per cent of aboveground costs.

There is no shortage of sites for underground facilities. The Army's Corps of Engineers has a list of 287 mines which could be used with minimum modifications. Limestone, sandstone and salt mines are considered to have the best properties. They permit wide spans, high ceilings and regular pillar arrangement.

The Corps of Engineers lists these requirements: Cover of more than 50 ft; floor area of more than 25,000 sq ft; rooms at least 20 ft wide by 10 ft high; floor grade not more than 3 per cent. Other factors, such as transportation and nearness to suppliers are the same as for an aboveground plant.

Not for Heavies—It is figured that most light and medium-heavy manufacturing is adaptable. Heavy manufacturing is out from a cost standpoint. If the product is bulky, such as a bomber, oversize rooms and exits needed would pretty much rule out underground facilities.

Abrasive Wheel Sales

1957	$175 million*
1956	170 million
1955	180 million
1954	140 million
1953	170 million

*STEEL estimate.

To grade grinding wheels, Norton Co., Worcester, Mass., uses music. When tapped, the wheel emits a note which is relayed to an oscilloscope. The operator translates the oscilloscope reading into a measurement of hardness

Abrasive Wheel Sales Gain

The industry expects broader applications of its products in aircraft, portable electric tools and automotive industries. Reduced metal removal by machine is major benefit

ABRASIVE WHEEL producers are tuned in to changing demands for their products. Reports Robert Cushman, assistant to the sales manager, grinding wheels, Norton Co., Worcester, Mass.:

"Faster jet planes and more powerful guided missiles indicate a continual introduction of new steels and alloys to withstand increased stresses and temperatures . . . those metals often require careful preparation in the billet stage, as well as smooth surfaces and dimensional accuracy in finishing.

"Closer co-operation between the steel and abrasive industries is indicated. New abrasive products will come out in 1957, and new techniques to grind these materials better will be employed."

Expansion — Manufacturers of abrasives will spend more than $50 million in the next three years for plant expansion; nearly half of that will go for wheel production. Carborundum Co., Niagara Falls, N. Y., will spend $30 million, while Norton will spend close to $20 million.

Sales by the industry in 1957 are forecast at $175 million (see table). They'll be bolstered by more automotive use and broader applications in ceramics, carbides and glass, but the physical volume of sales will probably not top this year's. Higher prices will boost the dollar shipments.

Better—Simonds Abrasive Co., Philadelphia, estimates its dollar sales next year will be up 15 per cent; if so, that will represent record volume.

Bay State Abrasive Products Co., Westboro, Mass., looks for a moderate sales increase in 1957.

Most new processes for forming metals (and technical improvements on current practice) stress closer initial tolerances and the reduction of machining time.

Thus, says the industry, wheel using industries cut costs of metal removal. New grinding machines are making better use of wheels, too.

Speed—Says F. W. Bonacker of Carborundum's Wheel Division: "Reflecting the trend toward faster machinery in industry, high speed grinding wheels continue to increase in importance in total industry sales. Accompanying this trend toward faster machinery has been increased emphasis on strong and more durable grinding wheels.

"The development of grinding wheels for nonmetallic applications has continued to increase. With residential and commercial building being maintained at high levels, sales to those markets are also expected to be well maintained."

Some other areas where markets are lively: The increased use of weldments in fabrication of metal parts is boosting the use of abrasive wheels for finishing welds. More small wheels are needed in finishing jet engine parts. In the making of drills, grinding of grooves is increasingly prevalent and has developed into a large application for wheels.

The Marketing Vice President: What's in a Name?

Metalworking companies in many industries are attacking the immensely complex problems of sales and distribution a new way: They are creating the post of marketing vice president—asking one man to integrate many traditional jobs into a functioning whole, who will, in turn, co-operate with the two other main areas of executive responsibility, finance and production.

What's in a name? Plenty. The marketing vice president can't be a sales vice president (the concept is too limited), nor can he be a marketing director without the authority of the vice presidential title.

What Will He Do?

1. Integrate many departments. How closely does your product planning group work with your sales training force? Advertising with market research? Sales with public relations? They should have one goal: That of your company's marketing division.
2. Co-operate with other divisions. Does production scare the pants off finance every time it asks for an appropriation? Does finance hold production down without reason? Marketing looks in two directions (finance and production) before making a move.
3. Establish company goals. Are there growth directions you've never considered because your top personnel don't have the time?
4. Get your company in tune with your industry, and the economy in general. Is your percentage of the total market increasing? How long is your market going to exist? What are its growth potentials? How many new products do you have in the planning stage?

What's His Background?

1. Although he needs fundamental sales experience, he has to think primarily in terms of the customer (what does he want?), rather than in terms of the company (how much can we sell?).
2. Any engineering background will be extremely valuable. But he must not confine his thinking to the product itself. The product's applications represent its only true value.
3. Production experience will pay off handsomely, if he remembers that the market must be known to exist long before the first unit is ever produced.
4. Profits are the focal point. An understanding of the relation of costs to production, distribution and other factors is necessary. He must never think in terms of raw data (increased sales, increased production); but only in terms of the profits created by raw figures.
5. Crux: He must rise above his specialty.

What Departments Report To Him?

1. Sales.
2. Sales training.
3. Advertising and sales promotion.
4. Customer service.
5. Public relations.
6. Product planning.
7. Market research and sales analysis.

Bigger Jobs for Marketing

The shift in title from sales vice president to marketing vice president is a trend signifying the growth of the marketing concept in metalworking

FORD MOTOR CO. made two announcements this year that keynote new marketing concepts: 1. The Edsel will be introduced in the fall of 1957. 2. James J. Nance, former president of Studebaker-Packard Corp., was named to Ford's new post of marketing vice president.

On the one hand, you have the company's determination to crack the medium priced car market in depth; on the other, you have Ford's recognition of the latest trend in sales and distribution management.

New Challenge—Although the two announcements were not strictly connected (the Edsel has been in the planning stage since 1948, in the styling stage since 1954), it's easy to assume that Mr. Nance has been called on to fit the Edsel into its place in the Ford line, and, from there, go on to a new era in which Ford may challenge General Motors Corp. product for product and line for line. (Mr. Nance's experience at Hotpoint Inc. has been cited by some as reason

enough for guessing that Ford wants to get into appliances.)

And Others—Many metalworking companies are taking a new look at their management lineups with two basic thoughts in mind. First, today's economy of expansion requires a company to grow just to keep pace with its industry. Second, new techniques of business management (such as market research, cost accounting and inventory control) must be efficiently located within the management structure.

The relatively new title of marketing vice president is designed to take advantage of these new concepts.

Of course, forward looking sales vice presidents or distribution vice presidents have been operating like marketing vice presidents for years without the title. Indeed, one top GM official believes the title is only a matter of fashion, and Donald M. Pattison, vice president, Motch & Merryweather Machinery Co., Cleveland, says many presidents and executive vice presidents have been essentially marketing men.

What's in a Name? — However, notes Mr. Pattison, "If a marketing vice president has a sales manager under him, the vice president will be in a better position to put some of the new techniques of management into effect."

There is the radical departure. Marketing has been an auxiliary to sales. Now the marketing concept is broadened to include sales. The sales manager is no longer asked to convert himself into a marketing man willy-nilly. He stays on the firing line of the day to day control of his selling team, while the marketing vice president assumes the responsibilities which include long range planning, integration of market research, sales training and product planning. He also serves as co-ordinator between production and finance divisions.

"The use of the title, marketing vice president, will broaden the job," sums up Richard E. Krafve, Ford vice president and general manager, Edsel division.

Definition — How does marketing differ from selling? Comments Frank J. Smith, marketing vice president, Columbus Bolt & Forging Co., Columbus, O.: "The marketing vice president is the orchestra director. The violins must come in at just the right moment; the cymbals must clang; the drum sound. Out of the seven departments (see box, page 38) must come the sweet sounds of greater profits for his company."

The marketing concept, says General Electric Co., introduces the marketing man at the beginning of the production cycle rather than at the end. The sales manager's perennial question ("What's my quota?") is replaced by the marketing vice president's statement of policy: "I'll give the market what it wants. If it doesn't want what I have, I'll find something it wants."

The marketing vice president plans from the viewpoint of the customer, instead of from the viewpoint of the company, thinks of investments rather than costs, is profit conscious, not volume conscious.

Facts of Life — Automation, Supplemental Unemployment Benefits, rising costs of equipment per production worker—those are only some of the facts the marketing vice president must work with. "Most sales executives are overworked; they need relief," says A. A. Togesen, marketing vice president, BullDog Electric Products Co., Detroit (division of I-T-E Circuit Breaker Co.) You can't ask your sales manager to do any more than he's doing now; hence the marketing vice president with the ability to see the big picture.

The president is a busy man, too. So the marketing vice president becomes the link between line and staff functions. From his position the long range goals of the firm seep down to the various department heads to create a team organization. The marketing vice president isn't choked with the routine details of company operation. At this level, long range sales planning takes place without the danger of putting off immediate work; that's the province of the sales manager.

Case Histories — National Metal Abrasive Co., Cleveland, is a good example of a small metalworking firm which has adopted the marketing concept. David E. Neustadt, vice president and director of marketing, expects sales to jump better than 25 per cent in 1957. Why? After developing a new abrasive and offering to guarantee that its use would cut airless blast cleaning costs by 15 per cent, few companies beat a path to National's door.

So Mr. Neustadt is broadening the use of airless blast cleaning himself, rather than relying upon equipment manufacturers to sell more machinery and thus increase the need for abrasives. He's currently conducting campaigns among foundries, forging plants and steel plants to shift to airless blast cleaning.

New Customers—Columbus Bolt & Forging is doing a similar job of trying to find new applications for its fasteners by seeking new customers in a greater variety of fields.

E. R. Jung, marketing vice president, Clark Controller Co., Cleveland, has put new emphasis on new products. A new product division has been set up under his direction to keep a steady flow of ideas coming in. Rapidly developing markets for electric controls dictate such a policy.

In Detroit, Russel Robins, marketing vice president, L. A. Young Spring & Wire Corp., has the primary responsibility of investigating companies which L. A. Young wants to buy.

Those are a few examples of what marketing vice presidents can do. All mean the lifting of the iron curtains that have existed in some companies between production and marketing, between sales and advertising, between product planning and customer service.

Outlook — In the future, believes a nationally known management consultant, more men will come to the responsibility of a marketing vice president's post by training in several departments. Forward looking companies are planning such growth now. The company that doesn't may find itself out of luck as competition for both men and markets intensifies.

The prime quality to look for in a marketing vice president: The ability to get things done through persons over whom he has no direct control. He will be no hero landing new accounts, but he will give your firm's goals explicit direction.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*

More Money for Defense in Fiscal '58

STEPPED-UP defense spending in fiscal 1958 will give additional push to an already hard-at-work metalworking industry. Predictions are that President Eisenhower will ask Congress for about $38 billion for defense when he presents his January budget message. The final defense allotment, though, could top that figure. Congress is in a watchful mood, suspicious that the administration may scrimp on defense spending to be sure of hanging on to a balanced budget. So the lawmakers could, as they did for fiscal 1957, tack more money on to the President's requests.

Increases for Air-Atomic Weapons

A substantial part of the increase will go for air-atomic weapons; research and development will also get a share. There will be some falloff in buying of conventional weapons and equipment. Indicative of trends in weapons: In 1954, the Air Force spent about 10 per cent ($600 million) for missiles. In 1958, the sum will be up to 35 per cent. By 1961, spending probably will top $2.5 billion. But the split between aircraft and missile spending will be about 50-50.

Congress To Look at Money, Credit

Watch for more congressional looks at money and credit problems. After preliminary study of testimony from his recent hearings on the subject, Rep. Wright Patman (Dem., Tex.) says he will press for a thorough examination of monetary policy, especially as it affects the "little man," and financing of schools, housing and highways. A determined critic of administration methods of combating inflation, Mr. Patman blames high interest rates (which he in turn blames on current Federal Reserve Board practices) rather than tight supply for price increases in metals, construction materials and machinery.

Plant Dispersal and Tax Amortization

From time to time, a business firm treks to Washington to try to get fast tax amortization on a new plant simply because the plant is dispersed—it is farther from the center of a prime target area than the old one was. In general, such requests are turned down. The reasons: 1. To be eligible for tax amortization, a plant must turn out a product for which an Office of Defense Mobilization expansion goal is still open. 2. The plant must meet dispersal criteria as set up by that office (a determination now made by examining each plant site on its individual dispersal merits). Some other things some fast tax hopefuls don't realize: 1. Even if an expansion goal is open, only the difference in capacity between the new and old plant is subject to amortization. 2. Dispersal in itself is no criteria for granting fast tax write-offs.

Aid for Copper-Nickel Alloy Ingot Users?

Action is under way to help out foundries, brass and bronze mills that use copper-nickel alloy ingots. Such users will be authorized by the Business & Defense Services Administration to use priorities to fill some needs. That, in turn, will permit ingot makers to get into the priority lineup for scarce nickel. Up to now, the ingot producers have had to settle for what nickel they could scrounge up on their own.

Tanker Proposals O.K.'d

Another 27 proposals for new tankers to be built by private firms have been approved by the Maritime Commission. This is in addition to 31 still under consideration and 23 under construction. This sudden spurt in tanker building will probably slow down talk about a big government tanker program. It doesn't cut out the possibility entirely, though, because the private firms are building on the basis of peacetime demand.

Nuclear Specialists Trained

Atomic Energy has plans to double the number of nuclear reactor specialists trained annually at Oak Ridge School. The candidates will take six months of concentrated courses in math, physics, chemistry and engineering at one of six selected universities, then move on to Oak Ridge. Applicants for the course can be sponsored by industrial firms or government agencies.

Meet Henry Berring: He's serving as deputy director, Scientific, Motion Picture and Photographic Products Division, Business & Defense Services Administration. His regular job is manager of market research of Weston Electrical Instrument Corp., which has loaned him to the government for eight months. He can be reached in Washington at room 4317, Commerce department. Phone STerling 3-9200, ext. 2911.

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High Production Draw Benches

Here's greater cold draw production at a substantially reduced cost! McKay's line of rugged, precision built equipment is designed to meet and exceed today's accelerated demands.

FOR EXAMPLE; Integral, centerline push pointing provides smooth flow and eliminates a costly operation. Die blocks and pusher blocks are retained in machined ways, eliminating bolts and facilitating change over. Carriage return speeds are stepped up, allowing more productive time in the draw cycle. Automated lines are possible merely by addition of standard units already proved and in operation.

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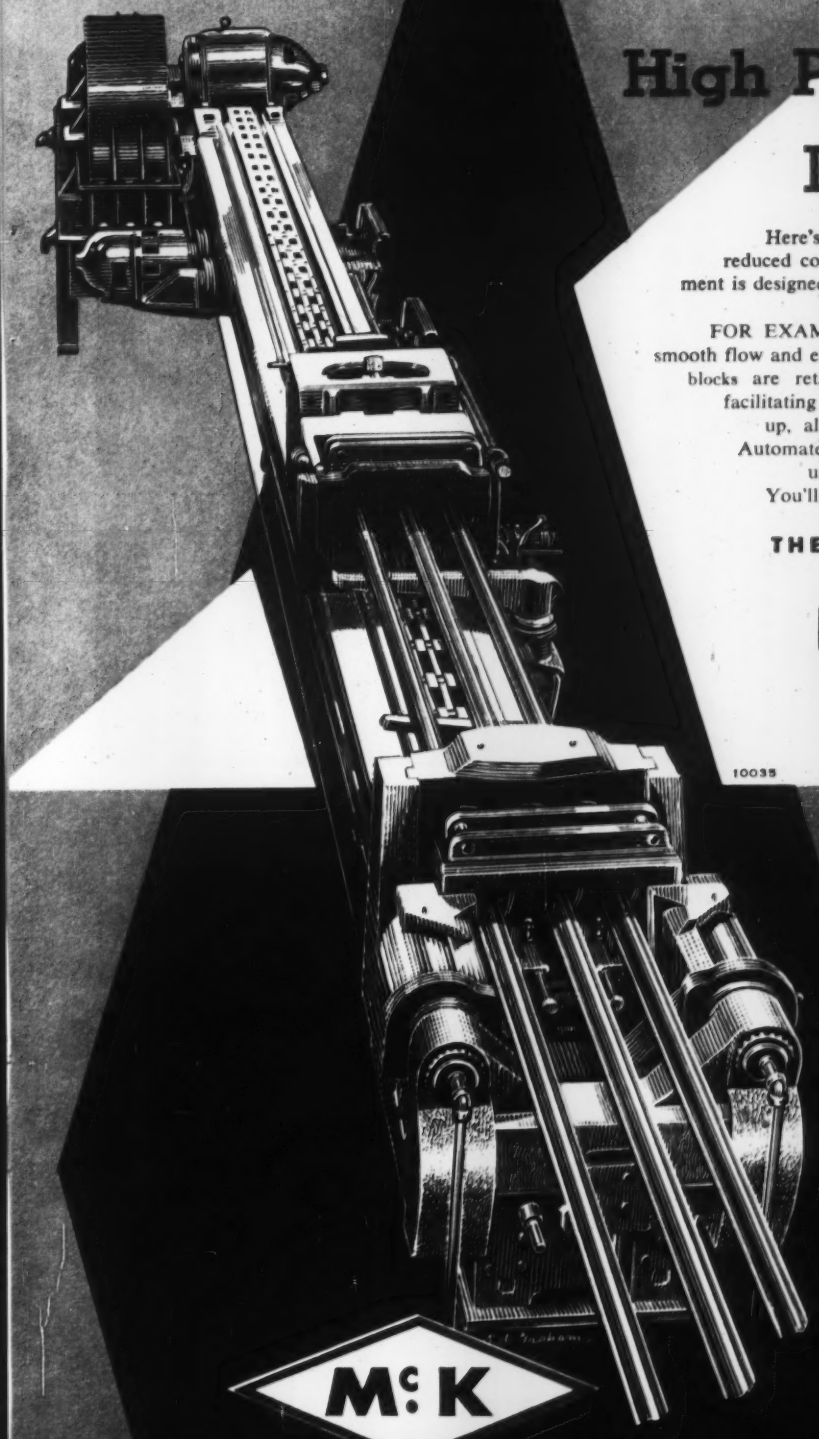
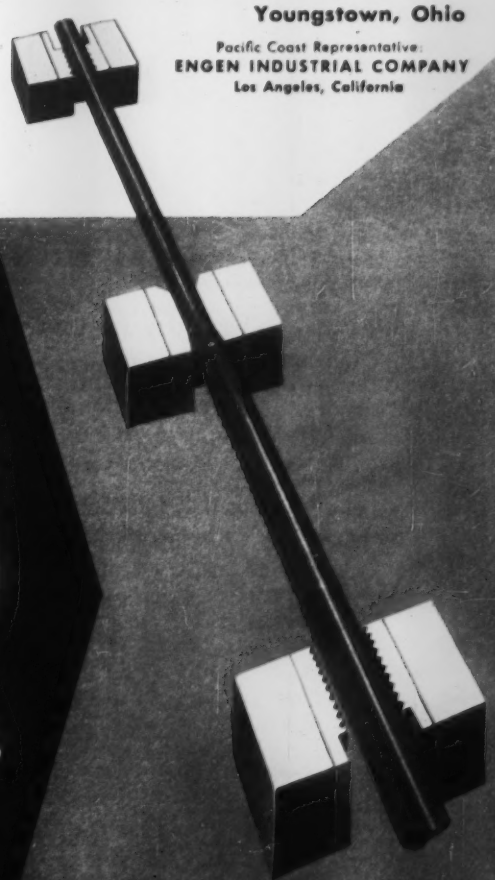
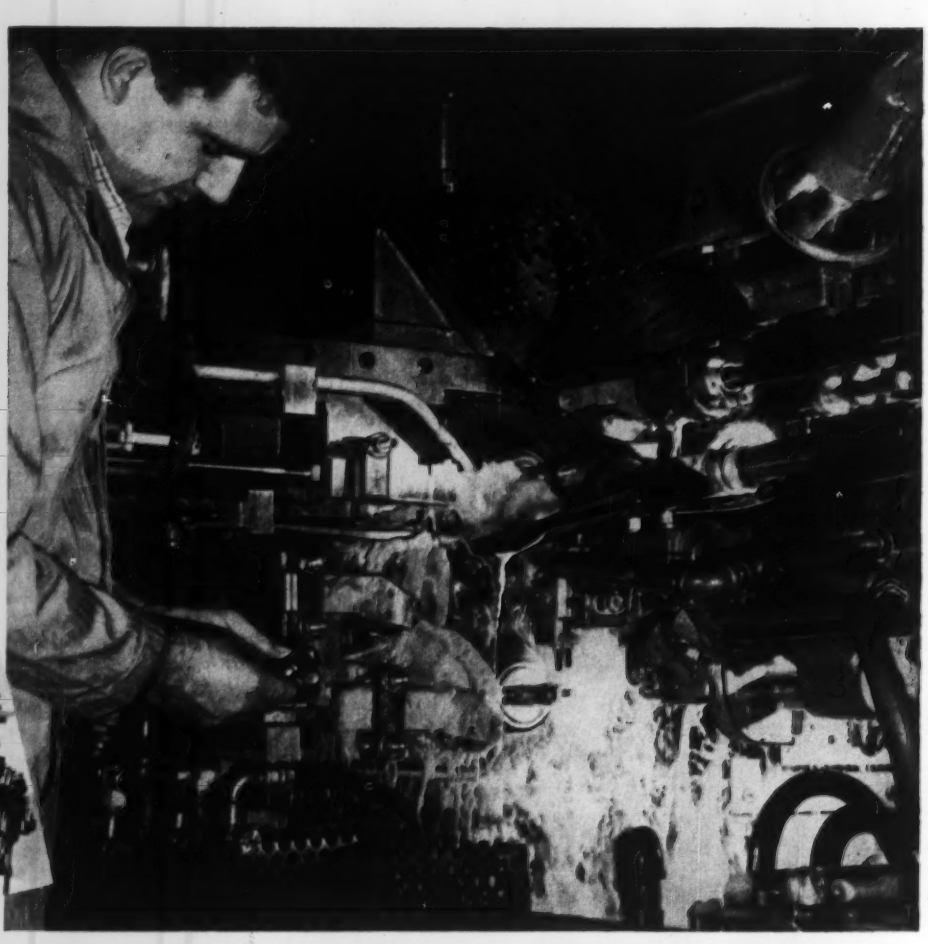
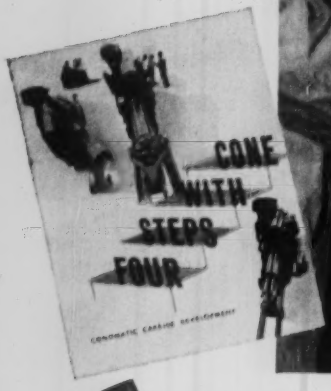




McK

SETTING THE STANDARDS OF QUALITY METAL WORKING ***MACHINES FOR TWO GENERATIONS***



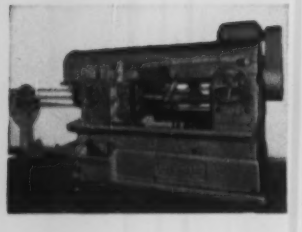


First with NEW "Automatic" Service

Cone was the first builder of multiple spindle automatics to provide machine users with an experimental service in the application of carbide tools.

This service is a practical means of determining the possibilities of carbide tools for production men without loss or interference with their regular production schedules.

A pamphlet "FOUR STEPS WITH CONE" describes this service. Send for your free copy.



Conomatic

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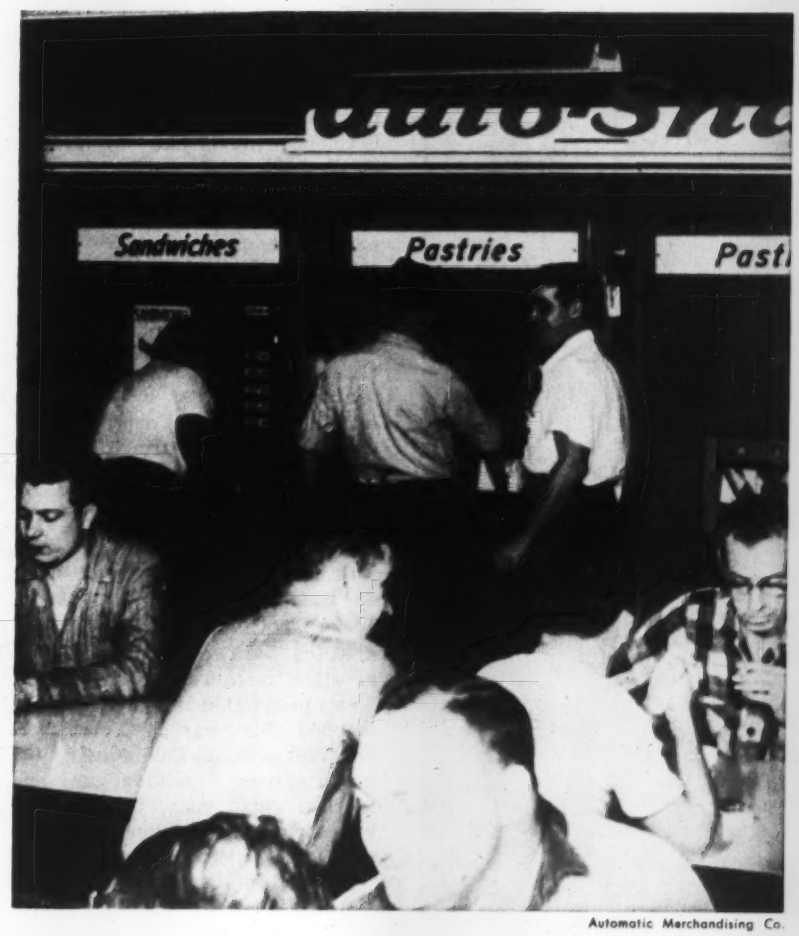


Automatic Merchandising Co.

Mechanized Lunches

Automated in-plant food service is one of the fastest growing segments of the $1.9-billion vending industry. It eliminates the investment in kitchen facilities

IT'LL PAY you to investigate automatic vending service for in-plant feeding if:

1. Your restaurant or cafeteria is losing money.

2. You're planning to provide cafeteria services.

Caterers providing in-plant feeding service claim they've solved management's three major headaches with cafeteria and restaurant operations:

1. The cafeteria loses money—too much to be considered a reasonable "subsidy."

2. 'Round the clock service is often prohibitive when second and third shifts are small.

3. Too many employees use the cafeteria only to supplement lunches they bring from home—a survey in the Boston area shows that nearly 85 per cent of employees do this.

Costs—If you have 300 or more employees, you can supply automatic lunches with minimum investment. Your only costs will involve provisions for an eating area, tables, water and electricity for the equipment. Catering firms install and maintain the equipment, plan and prepare menus.

With less than 300 employees, you may be charged a fee, depending upon the volume of sales. Caterers have found that it's generally unprofitable for them to install equipment for less than 300. Even if you do work with a "minimum profit contract," your costs may be nominal.

Automatic Merchandising Co., Chicago, recently installed a bank of machines in a plant employing about 200. "Total cost to the firm amounts to 50 cents a month per employee," reports William Fishman, president.

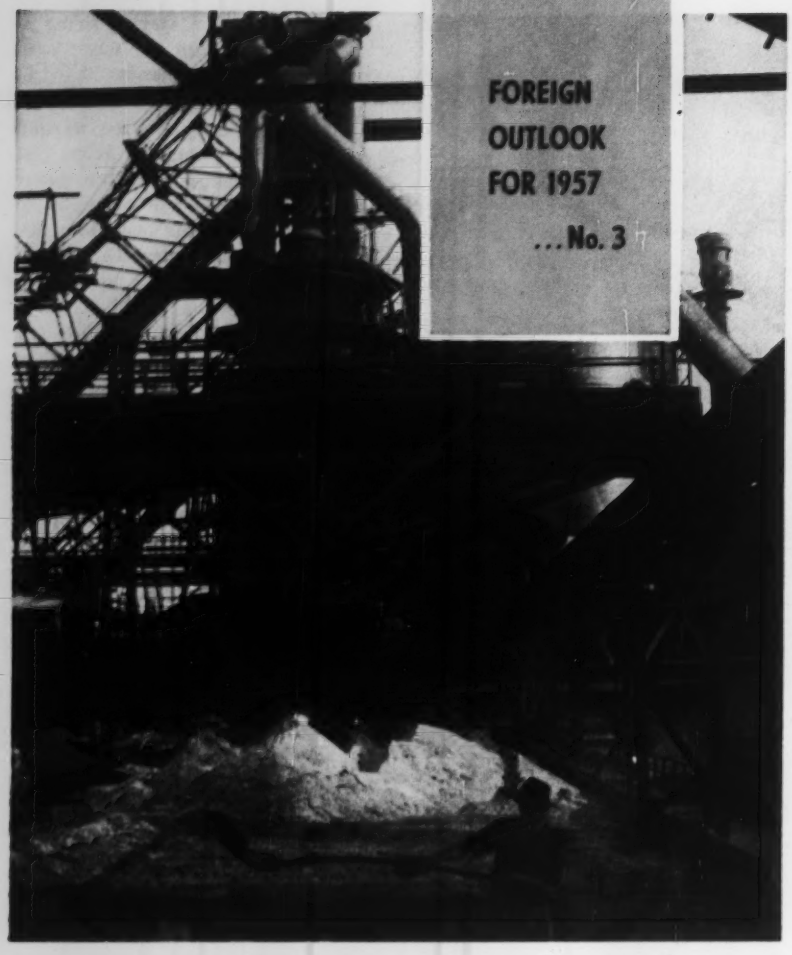
One of the nation's largest firms in this type catering is the Automatic Merchandising Corp. of Medford, Mass. President William C. McConnell Jr. reports his concern is serving 75 companies and does an annual business of $2 million.

Sales — "Our average sales through vending equipment amount to about $10 a month per employee," says Mr. McConnell. "Several of our installations are in General Electric Co. divisions whose plant managers report vending equipment sales often total more than those of the cafeterias which were discontinued."

Says Mr. Fishman: "The biggest appeal of our type of service is to companies which do not have cafeterias but want to provide some type of cafeteria service. Minimum investment in kitchen facilities and the necessary handling equipment for plant cafeterias is about $25,000. This is eliminated with our type of service. Don't overlook the mobility of our machines. This expedites the relocation of the eating area.

The Plan—A typical automatic lunch line has around seven machines. Menus include: Hot and cold beverages, soups, stews and meat dishes, hot and cold sandwiches, salads, vegetables and desserts. Three things the caterers emphasize: Prices are competitive with those of restaurants and sandwich shops; equal or better quality is maintained; menus are balanced and varied from day to day.

Vending caterers generally like three to five-year contracts.



German Economy Is Strong

Inflation is making little headway. The expansion of metalworking will continue. Biggest headache: Will Germany's foreign customers stay strong enough to buy?

THE WORLD'S third largest steel producer will set another record this year by turning out 23.5 million tons of steel, 2.2 million tons more than it did in 1955, the previous record.

Since 1950, the West German steel industry has spent about $1 billion on its expansion program. Outlook for 1960: Production of 32 million tons of steel.

In 1957—Expansion of facilities to produce plates and sheets will predominate. Total production should hit the 25-million-ton mark.

There's much concern about the raw materials for steel. West Germany plans to increase coal production by 40 million tons over the next 20 years, a 30 per cent hike over current levels. The average mine now produces around 4000 tons a day. Needed: More mines that will produce 20,000 tons a day. Next year, about 25 million tons of coal will be imported from the U.S., compared with imports of 16.5 million tons this year.

To beat the shortage of ore and coal, at least two German steelmakers are building plants in undeveloped areas like the Middle East, India and Burma.

Krupp Industries is seeking a U.S. government loan to help finance such projects.

Shipbuilding—German access to ore deposits in Sweden, Canada and Venezuela is possible only through the payment of high (and getting higher) freight costs. Look for a continued expansion of Germany's maritime industry. Construction of larger than ever freighters and bigger loading and storage facilities seems assured.

In 1956, West German shipyards completed about 1 million gross tons of shipping, and started work on 1.1 million gross tons. About 70 per cent of that is exported.

Autos — The boom is still on in other metalworking industries. New production heights will be reached this year by Ford, Opel and Volkswagen. The industry will produce over 1 million cars and trucks. Next year, the industry will spend $300 million for expansion and modernization, compared with $250 million it spent in 1956.

Another consumer industry, household appliances, boosted its production 10 per cent.

Machinery — The West German machine tool industry stepped up employment 7 per cent in the first half of 1956, and will end the year with production up 22 per cent.

Tremendous orders from abroad account for the favorable position of machinery makers. New foreign orders are still running ahead of export deliveries.

Credit—To overcome the labor shortage in West Germany, the modernization and re-equipment of factories for automation is the goal of many industrialists. But money for such projects is scarce. Even if you're willing to pay interest rates as high as 10 per cent, you can't be sure of obtaining capital. There is no program of government loans to help either.

Output per man in West Germany remains lower than that of most other West European countries, but there are signs of improvement: At least one machine tool maker has punched card con-

trolled lathes in operation; the first International Business Machines Corp. 705 was recently installed.

Labor—Socially conscious Germany hopes to cut the work week from 45 to 40 hours, but this doesn't look possible until more mechanization takes place. One solution is the increased use of foreign labor, especially Italian.

The exodus from Hungary is probably easing the skilled labor shortage. Women are being drawn into the labor market by the promise of equal pay for equal work.

The German draft hasn't been received too kindly by industry because of the labor shortage. Rearmament also puts demands on limited German capital for investment.

Outlook — With unemployment practically nil, exports rising faster than imports and metalworking generally operating at capacity levels, West Germany is in the best position of any European nation.

Production expansion will continue into 1957 without a doubt, though German industry is approaching its expansion limits. Gross national product rose 8 per cent in the 1955-56 period; it will climb 6 to 7 per cent next year.

First sign of inflationary controls: The government will probably regulate consumer credit by controlling down payments and the length of repayment periods.

Of all European nations, the Suez situation bothers West Germany least. But some effects will be felt: Principally in lowered buying power for German goods on the part of Britain, France and Italy.

The Suez Crisis and Germany

West Germany is in the best position of any West European country:

1. One-third of its oil comes from domestic production.
2. Most imports of oil come from Venezuela and the U. S.
3. Its iron and steel industry derives only 15 per cent of its energy from oil, compared with 25 per cent in France and 40 per cent in Britain.

Benelux Boom at Its Limit?

It may have reached a plateau in its development. It needs: Improved productivity, more money for research to start new industries and more skilled labor

THE PROSPERITY of 1956 will carry into 1957 in Belgium, Luxembourg and the Netherlands.

But the rate of their economic growth will taper off: If Benelux, it's a case of a booming economy approaching the limits of material and manpower supplies. When that happens, inflation is close by.

Labor—Contributing to the three nations' problems: Labor wants and will probably get healthy pay boosts in 1957. After an 8 per cent hike in 1956, look for Netherlands workers to gain a 9 per cent wage increase next year.

Belgian miners negotiated a 10 per cent raise this year. The continued shortage of miners (foreign labor is being actively recruited), will contribute to demands for more. The situation may be eased somewhat by the relocation of surplus labor from Flanders.

Benelux countries recently concluded an agreement for a common labor market, but this will not help the separate economies until full economic union is achieved.

Materials—The possibilities of a coal shortage this winter are high, especially with increased demands being made on this fuel. Coal production in Belgium was off 12 per cent in September from that of September, 1955, because of the labor shortage.

Although the Belgian steel industry is operating at peak capacity, pressure from steel users like construction and heavy equipment makers continues to be tremendous.

In 1956, Belgian steel production will set a new record of 7 million net tons, an increase of 8 per cent from 1955. Look for production in 1957 to only match this year's, if the Suez crisis drags on.

Demand—All Belgian industry is running at record levels. Netherlands' gross national product will increase next year, although probably not as much as it did from 1955 to 1956 (4 per cent).

Continuously rising demand is contributing to the inflationary tendencies of the wage hikes. Now the Netherlands has attempted to curb capital spending by cutting off some tax benefits for new investments. The situation is somewhat similar to the U.S. tight money policy.

The key here, as in the rest of Western Europe: Increased productivity.

Problem — If the world boom sags, Benelux would be one of the first areas to feel it. Better than 40 per cent of Belgian production (and more of the Netherlands') goes for export. If world demand for their products lessens, high Benelux prices would encourage foreign buyers to go elsewhere.

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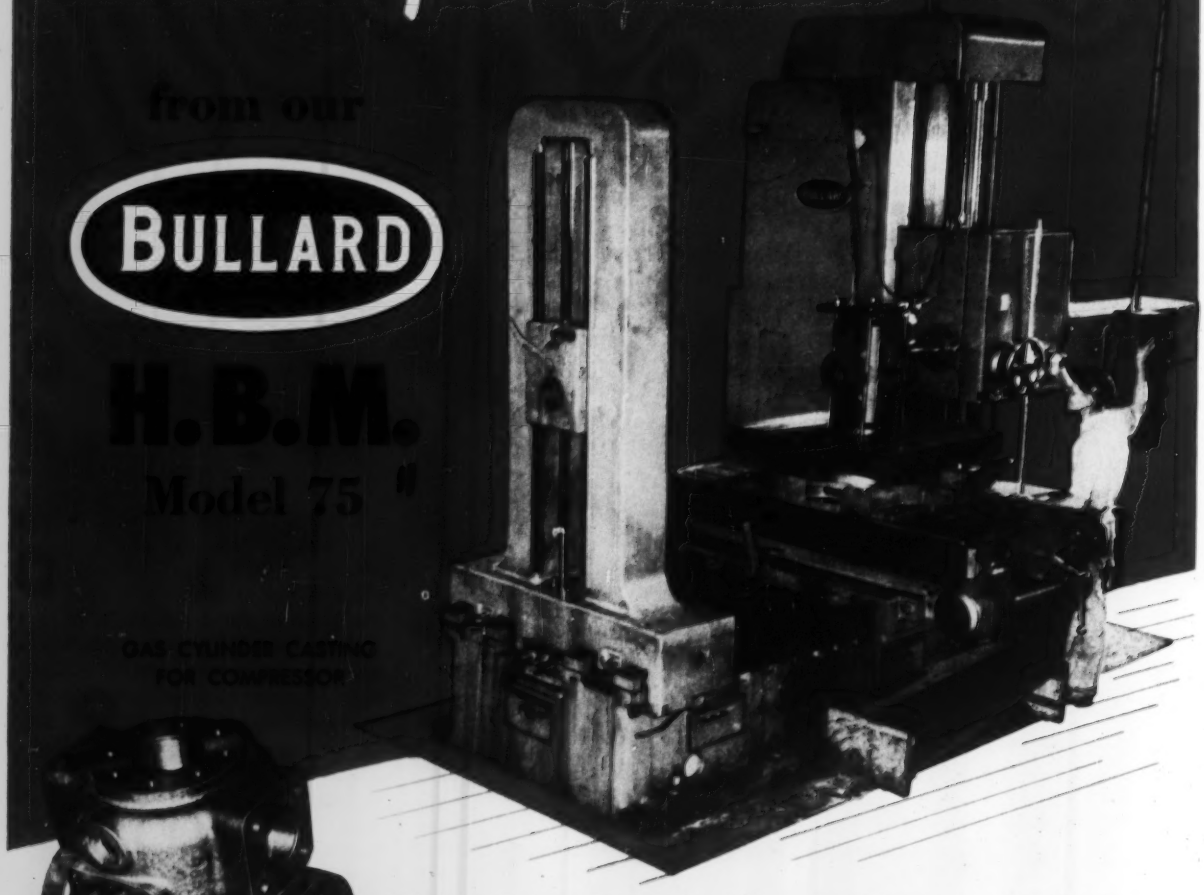
Model 75



"The acquisition of our Bullard HBM, Model 75 has eliminated a production bottleneck by giving us a reliable machine to handle our output" says Mr. Frank A. Kocevar, Chief Industrial Engineer at The Joy Manufacturing Co., of Michigan City, Indiana, manufacturers of portable and stationary compressors for industry.

This "built-in reliability" of the Bullard HBM, Model 75 can be applied to your boring, milling, drilling and facing problems — check its outstanding features by calling your nearest Bullard Sales Office or Distributor or for a complete catalog, write to —

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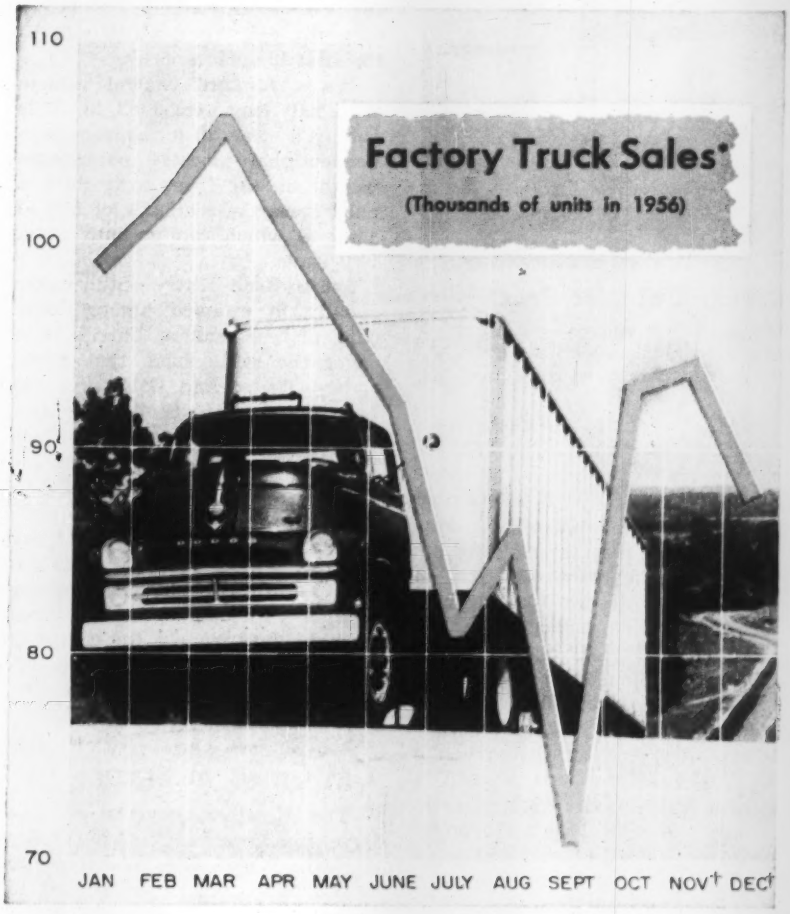

*From U.S. plants only.
†Preliminary.
Source: Automobile Mfgrs. Assn

Trucks Lag in '56

But a fourth quarter spurt may help 1957 sales. Production estimates for next year range from 900,000 to 1.2 million. Heavy vehicles will continue to sell well

TRUCK PRODUCTION is coming out of the temporary doldrums it fell into during the third quarter. Preliminary estimates from *Ward's Automotive Reports* peg U.S. truck output at 1.1 million units for 1956. That's a low mark for trucks. With the exception of 1954, output hasn't slipped below 1.2 million units since 1946.

Fourth quarter domestic production should hit close to 270,000 units, compared with 237,000 during the July-September period. Also, look for January and February scheduling aimed at 100,000 units monthly.

Domestic—If current predictions hold, 1957 should see more than 900,000 trucks turned out. That's the estimate Harlow Curtice, GM president, has made for next year.

Mr. Curtice is more conservative than Philip J. Monaghan, general manager of GM's Truck & Coach Division. He claims truck output will roll along at close to a 1.2 million rate in 1957.

Winners—Independent producers have made the biggest gains this year. White Motor Co., Cleveland, Diamond T Motor Car Co., Chicago, Mack Trucks Inc., New York, and International Harvester Co., Chicago, all will equal or better their 1955 output. The big reason is that these companies make heavy duty, over-the-highway trucks and tractors which have been strong sellers in the growing highway program.

Makers of lighter trucks (the 10,000-lb and under groups) have had losses ranging from 7 to 18 per cent. The drop in farm incomes has been largely responsible for this decrease.

Brighter Note—Next year, farm incomes are expected to be up at least 5 per cent. Dodge, Ford and Chevrolet truck executives think this should boost sales of ½ and ¾-ton pickups as much as 12 per cent. This will put light duty truck sales up around 570,000 units.

In any case, the companies want to be ready with a flock of improved models which will win buyers. Mr. Monaghan even suggests that engineering changes are coming so rapidly in truck lines that formal presentations may be discontinued in favor of running changes.

Advanced—One change on GMC trucks this year is the addition of air suspension units for all models. GMC also is making the units available in a do-it-yourself package for truck and trailer manufacturers.

"Tests indicate the advanced design of GMC truck air suspension will permit a 3 to 8 per cent increase in trailer cargo capacity, reduce vehicle weight, eliminate spring lubrication, repair and replacement, simplify loading and unloading through constant floor height and provide better load distribution," reports Mr. Monaghan.

Workings — Air suspension is

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The Ford Ranchero Is Combination Car and Truck

This half-and-half vehicle comes with a 272 cu-in. V-8 engine (190 hp) or a 292 cu-in. V-8 developing 212 hp. Classed as a highly styled pickup truck, the Ranchero can handle nearly ¾-ton; it sports a passenger car cab

simple in operation. The GMC version sports four rubberized bellows in front of a truck or tractor, two over the rear axle. Tandem axle jobs have four bellows in the rear.

An air compressor supplies air to the bellows, and leveling valves automatically control the inflation of each bellows. Result: A level, constant vehicle height under all load conditions. The pressurized air replaces leaf springs in absorbing road shock and vibration. All linkage is mounted in rubber which helps eliminate lubrication problems.

Diesel Fan—Diesel engines are gaining popularity. For 1957, it looks like almost 27 per cent of the heavy duty market (over 26,000 lb) will be so powered. GMC now offers a hydraulically driven fan on all diesels to give added fuel economy. The fan also boosts usable horsepower because it goes on only when engine cooling is necessary.

Final GMC feature for '57 is the DRA 802, a highway tractor with a turbocharged diesel engine and aluminum cab construction. It weighs 9434 lb and has a gross vehicle weight of 55,000 lb. It's supposedly the lightest tractor on the the road for its pay load capacity. Mr. Monaghan says production will start next month.

Competitors—Dodge, Studebaker and Ford don't plan to be left out of the 1957 sales race. They've increased cargo capacities, horsepower and fuel economy. At the same time, the trend to lighter vehicles and shorter cab lengths is continuing to make for bigger pay loads and lighter tax loads for users.

M. C. Patterson, Dodge Division president, says the Dodge "K" series covers 98 per cent of all hauling needs. The COM-76 offers nine engines with 12 horsepower ratings ranging from 113 to 232 hp. Chrysler pushbutton shifting is available on all low tonnage and forward control models.

Approximately 65 per cent of the 10.5 million trucks in use in the U.S. are under 9000 lb, gross volume weight, reports Mr. Patterson. That's why Dodge has a 120-hp, 6-cylinder engine and a 204-hp V-8 in the lighter class trucks. Comparable horsepowers last year were 115 and 172.

U.S. Auto Output

Passenger Only

	1956	1955
January	611,190	659,508
February	554,667	675,495
March	575,559	794,015
April	547,766	753,851
May	471,994	724,892
June	430,141	649,393
July	448,804	659,763
August	401,997	614,493
September	190,709	461,591
October	388,922	517,813
November	581,088†	749,061
11 Mo. Total	5,202,837†	7,259,875
December		682,257
Total		7,942,132

Week Ended	1956	1955
Nov. 17	135,641	179,250
Nov. 24	118,949	151,799
Dec. 1	159,976	177,712
Dec. 8	167,576	178,409
Dec. 15	162,483†	169,256
Dec. 22	163,000*	150,881

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Tilt—In addition to the half-and-half job shown at left, Ford Motor Co. is introducing a heavy duty tilt cab truck which will be the first in such a series.

It's a forward control vehicle with cab length of 80.3 in. This cab (it's some 30 in. shorter than conventional models) puts more weight on the front axle. Such a shift frees the rear axle of 800 to 1100 lb which can go into extra pay loads.

South Bend Entry—Studebaker usually is grouped among independent truckmakers, but its lines cover the same fields that Ford, Chevy, Dodge and GMC products do. In addition, Studebaker has entered the heavy duty market with a series of 4-ton trucks carrying gross vehicle weights of 18,000 to 19,000 lb.

Horsepower rates are up 21 per cent, torque increased up to 24 per cent on all Studebaker Transtar engines. Pushing special features on light duty models, the company gives emphasis to its nonslip differential on ½-ton trucks, and power steering on 1 and 2-ton jobs.

GM Grows in Brazil

The Brazilian government has given the go ahead to General Motors do Brazil, GM subsidiary, to manufacture trucks as its part in developing the Brazilian automotive industry.

The company has been assembling trucks in Brazil for almost 30 years. This latest release gives GM permission to build a modern parts foundry and an engine manufacturing plant near Sao Paulo, Brazil.

Additional assembly operations of truck cabs and refrigerators will continue in GM do Brazil's plant in Sao Caetano du Sul, near Sao Paulo. GM will put $10 million in machinery and equipment into the foundry and engine plants.

AMC Drops $19 Million

American Motors Corp., Detroit, reports a loss of $19.7 million in its fiscal year ended Sept. 30, 1956. The deficit is over and above nonrecurring profits of $10.6 million from the sale of Ranco Inc., stock and from tax credits of $1.4 million.

MR. JAMES T. RICCELLI

Poured

Making high quality leaded alloy steels is no tea party. The planning, the constant scientific study, the checking of minute details by skilled metallurgists and workmen that goes into the creation of one billet of leaded steel represent one of the highest forms of industrial craftsmanship. That is why Copperweld, manufacturer of the most diversified lines of lead-treated alloy and carbon steels, is recognized leader in the manufacture of hot-rolled blooms, bars and billets.

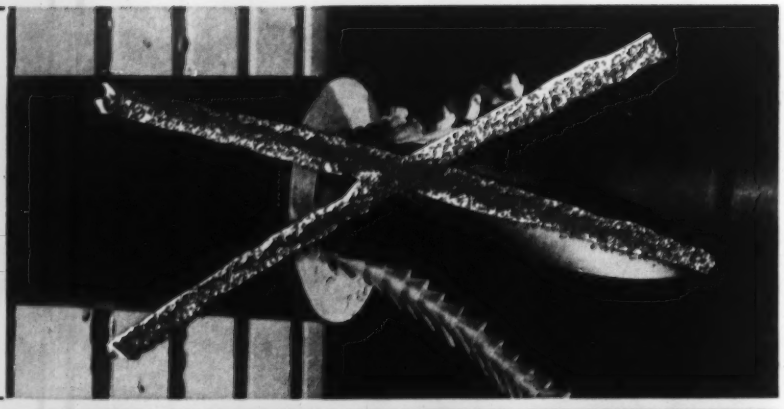
ARISTOLOY STEELS

COPPERWELD STEEL COMPANY • Steel Division • Warren, Ohio

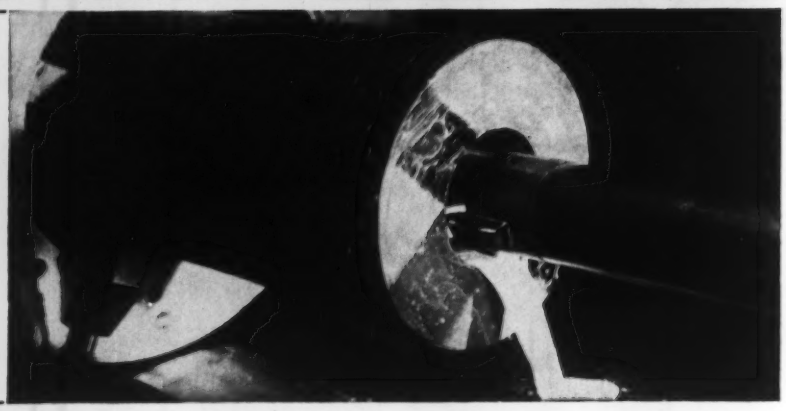
EXPORT: Copperweld Steel International Co., 225 Broadway, New York 7, N. Y.

How to save a big step when you make hollow parts...

SKIP
drilling bar stock



START
with finish boring of TIMKEN® seamless steel tubing



WITH Timken® seamless steel tubing as your base stock, finish boring often is your first production operation in making hollow parts. You save a big step because you don't have to bore out the center hole. It's already there! And because Timken seamless tubing eliminates one boring operation, it frees part of your screw machines for other jobs. Result—you add machining capacity *without* adding machines.

And figure in this extra saving. With Timken seamless tubing you get more parts per ton of steel. There's less metal to hog out.

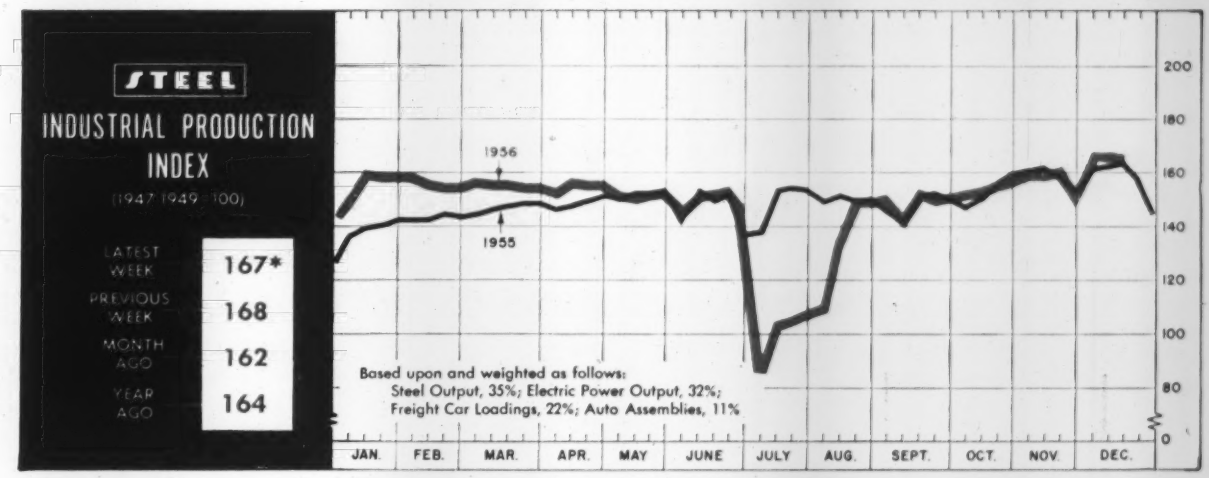
Timken Company engineers will study your problem, recommend the most economical tube size for your hollow parts job—a size guaranteed to clean up to your finished dimensions.

You can get better quality products, too. Manufacture of Timken seamless tubing is basically a forging operation. It produces a uniform spiral grain flow for greater strength—a refined grain structure that brings out the best in the metal's quality. And this quality is uniformly maintained from tube to tube, heat to heat, order to order. Our metallurgists will gladly work with you, show you where Timken seamless steel tubing can save you money. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO."

TIMKEN *Fine Alloy* STEEL

TRADE-MARK REG. U.S. PAT. OFF.

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING



*Week ended Dec. 15.

Mid-East Tension Spurs Outlook for '57

TENSION in the Middle East is causing many American economists to raise their sights for business in 1957. It looks like the second half will be just as good as the first.

Here is the way it shapes up: The first half will see a continuation of current high level activity, whether it be an integral part of the 1956 boom or simply momentum built up over two years. It is now evident that some kind of extra foreign aid is going to be offered foreign nations who need it. If the program gets rolling during the first half, it will push some of the activity we expect then over into second half. If it doesn't get rolling until midyear, this extra aid will take up some of the slack many persons thought would be appearing later on in the year.

Steady Rise—Estimates of 1957's gross national product, that catch-all barometer of the nation's economic well being—range all the way from $425 billion to $434 billion. Even when a cost of living factor is worked into such figures, the end result is a continuation of the steady rise in our prosperity. One noted bank economist went on record recently for a $430 billion economy next year. Two days later, he was reported to have said: "If I had to figure it all over again, I would raise my sights."

Another banker, who is usually somewhere between the optimists and the pessimists, came up with a GNP of $427 billion. "Two or three weeks ago I would have said somewhat lower, but the Middle East thing is going to have its effects on us."

How Much Aid?—It is too early to tell what kind and how much aid will be offered. But indications are it will be both money and materials and will be world-wide. In addition to direct aid, there will be a large shipbuilding program to supply the supercarriers needed to transport greater quantities of oil. The full effects of this program may be slow in showing up, but it will put an added burden on the producers and consumers of already-tight structural shapes and plates.

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,511[1]	2,522	2,338
Electric Power Distributed (million kw-hr)	12,000[1]	12,047	11,602
Bituminous Coal Output (1000 tons)	10,605[1]	10,940	10,935
Petroleum Production (daily avg—1000 bbl)	7,350[1]	7,353	6,920
Construction Volume (*ENR*—millions)	$528.1	$323.3	$348.8
Auto, Truck Output, U. S., Canada (*Ward's*)	198,163[1]	202,290	203,868
TRADE			
Freight Car Loadings (1000 cars)	720[1]	738	715
Business Failures (Dun & Bradstreet)	270	254	219
Currency in Circulation (millions)[3]	$31,660	$31,450	$31,244
Dept. Store Sales (changes from year ago)[3]	−4%	−1%	+5%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$22,112	$24,065	$22,177
Federal Gross Debt (billions)	$276.2	$276.6	$280.0
Bond Volume, NYSE (millions)	$33.3	$38.2	$19.5
Stocks Sales, NYSE (thousands of shares)	11,811	11,989	12,184
Loans and Investments (billions)[4]	$86.2	$86.2	$85.5
U. S. Govt. Obligations Held (billions)[4]	$25.8	$26.1	$29.6
PRICES			
STEEL's Finished Steel Price Index[5]	225.92	225.92	208.90
STEEL's Nonferrous Metal Price Index[6]	253.2	255.0	270.5
All Commodities[7]	116.2	116.0	111.0
Commodities Other Than Farm & Foods[7]	124.6	124.5	119.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1956, 2,461,893; 1955, 2,413,278. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100

Coming

Jan. 7

IN

STEEL

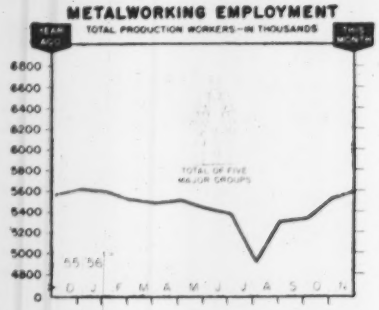
What Metalworking Management Expects in 1957

No crystal ball here: Just the facts. STEEL's annual survey of 7500 managers of metalworking plants queries them on their expectations for their own plants. That's the best sample of grass roots thinking in metalworking available.

We don't have to knock on wood when we point out that previous surveys have been remarkably accurate: Our respondents know what they're talking about, because they know their own plant operations.

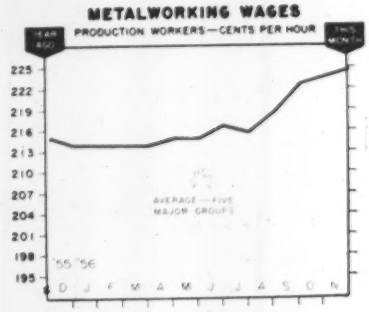
A year ago they predicted the growing market for metalworking's products in 1956 within 2 per cent; two years ago they called the turn on the 1955 boom; 10 years ago they predicted the rising demand for metalworking's products in 1947.

What will be the score in 1957 on production? Employment? Costs and prices? New products? Expansion? Research? See your Jan. 7 issue of STEEL.



1955	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
Nov.	1,133	932	1,225	866	1,446
Dec.	1,141	928	1,250	868	1,471
1956					
Jan.	1,141	913	1,261	854	1,449
Feb.	1,138	899	1,274	849	1,392
Mar.	1,130	893	1,281	842	1,354
Apr.	1,136	895	1,292	874	1,332
May	1,117	881	1,281	872	1,295
June	1,118	870	1,278	866	1,269
July	743	825	1,254	854	1,250
Aug.	1,091	864	1,257	878	1,235
Sept.	1,126	885	1,262	891	1,205
Oct.*	1,132	911	1,267	916	1,319
Nov.*	1,135	917	1,273	919	1,385

*Preliminary.
U.S. Bureau of Labor Statistics.
Charts copyright, 1956, STEEL.



1955	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
Nov.	231	203	215	191	231
Dec.	232	203	216	192	228
1956					
Jan.	233	203	217	193	225
Feb.	232	202	217	193	224
Mar.	232	203	217	194	225
Apr.	233	204	218	196	226
May	233	204	218	196	226
June	234	206	219	197	228
July	227	206	220	198	229
Aug.	236	207	221	199	232
Sept.	241	211	225	201	236
Oct.*	242	213	225	203	238
Nov.*	243	212	226	203	241

*Preliminary.
U.S. Bureau of Labor Statistics.

Indirect effects will be felt in our foreign trade. Exports of some materials, such as autos, may suffer, but the declines will be offset by exports of other equipment to help bolster the European economy. Equipment and money will also be offered to other nations in an attempt to increase Western influence in areas where Communistic influence seems to be faltering.

In addition, the government probably will hike its spending for national security.

Psychology—If the international situation should become more serious than it now appears to be, it could set off a period of scare buying which would rival that of the Korean War era. This would result in abnormally high production of steel and durable goods and send prices and inventories soaring. Barring such a psychological reaction, 1957 will see a continuation of the business uptrend.

Employment Passes Peak

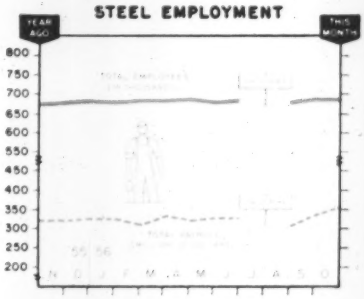
Employment figures are past the peak for this year, and any comparisons with the year-ago period will not be as favorable as they were a short while ago. Reason: There is not enough of a bellows in the labor force to allow for any sizable increase in employment. Total employment last month declined from the October level, but it was still the highest November on record. Most of the decrease came in agriculture, which is past its seasonal peak. At the same time, the Commerce and Labor departments report the increase in metalworking employment was less than seasonal (see chart above).

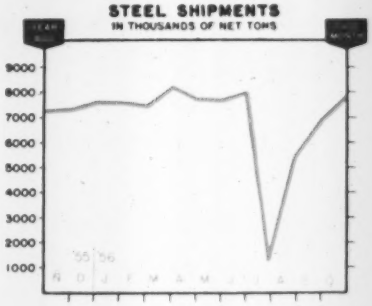
Construction Record Near

Despite a continuing weakness in residential construction, 1956 will end up with the all-time record for this industry. F. W. Dodge Corp. reports that November contract awards for future construction in 37 states east of the Rockies totaled approximately $1.7 billion, a decrease of 6 per cent from the figure for November, 1955. To date, the industry is still 5 per cent ahead of last year's period.

Handling Equipment Zooms

The seasonal upturn in bookings for material handling equipment occurred two months earlier this year than it did last year, says the Material Handling Institute Inc.





	Employment in Thousands		Payroll in Millions	
	1956	1955	1956	1955
Jan.	681	605	$329.1	$258.8
Feb.	684	616	317.3	255.1
Mar.	685	630	338.1	288.2
Apr.	688	643	326.7	282.0
May	680	654	333.6	249.1
June	683	667	332.4	298.4
July	n.a.	676	n.a.	296.8
Aug.	677	680	300.9	320.7
Sept.	688	680	339.0	317.1
Oct.	687	678	358.9	325.1
Nov.	...	680	....	326.1
Dec.	...	682	....	330.6

n.a.=not available because of strike.
American Iron & Steel Institute.

	Net Tons		
	1956	1955	1954
Jan.	7,587,870	6,009,958	5,727,600
Feb.	7,468,393	6,119,900	5,364,978
Mar.	8,255,824	7,268,795	5,583,690
Apr.	7,783,873	7,279,321	5,287,972
May	7,764,776	7,540,889	5,423,168
June	8,077,805	7,770,213	5,887,488
July	1,288,988	6,250,597	4,490,179
Aug.	5,539,915	7,053,615	4,681,242
Sept.	7,058,028	7,378,247	5,004,222
Oct.	7,930,957	7,216,821	5,035,364
Nov.	.....	7,247,994	5,240,209
Dec.	.....	7,580,943	5,448,649

American Iron & Steel Institute.

Rebounding from the sharp decline in September, the institute's index rose to 143.38 per cent of the 1954 mean. By the end of October, the industry had already booked 104 per cent of its total 1955 business.

Fastener Outlook Bright

Fourth quarter sales will push the fastener industry's 1956 dollar volume 3 per cent higher than it was in 1955, and prospects for the first half of 1957 look at least as good, says Harry O. McCully, vice president in charge of sales for Russell, Burdsall & Ward Bolt & Nut Co. The automotive industry, heavy construction and farm implement manufacturers will be strong factors, while there will be few weak spots, he says.

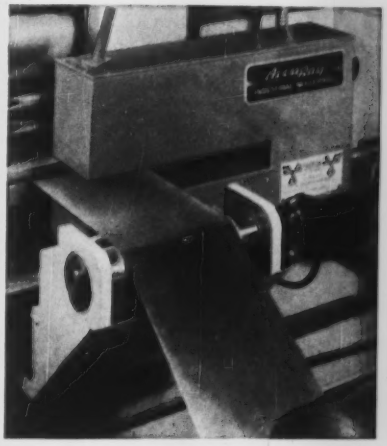
Salesmen Optimistic

From Parker Appliance Co., Cleveland, comes the word that over-all industrial activity will increase during at least the first six months of next year. District managers for Parker, which sells industrial products to practically all major industries, "are unanimous in believing that 1957 will be an even busier year than 1956," states D. A. Cameron, general sales manager. Industries showing the greatest potential for next year, say the salesmen, are aircraft, road building machinery, material handling equipment, automobile and machine tools.

Trends Fore and Aft

- Sales of home laundry equipment—washers, dryers and ironers—will establish a record this year, says the American Home Laundry Manufacturers' Association. It will be close to 6,227,000 units, 9 per cent better than last year's record.
- Wholesale prices continued their upward trend in November after leveling off the month before. Score for the last three months (1947-1949 = 100): September, 115.5; October, 115.6; November, 115.9.
- The trucking industry, which claims to be an accurate short-term business indicator, says many businesses are re-evaluating their 1957 prospects. While businessmen may ask that new shipments to them be delayed to permit depletion of inventories, they may later call for them to be resumed on an equal or greater scale.

MONEL • NICKEL • COPPER • ALLOYS
THIN STRIP
UNIFORM
AS THE ATOM

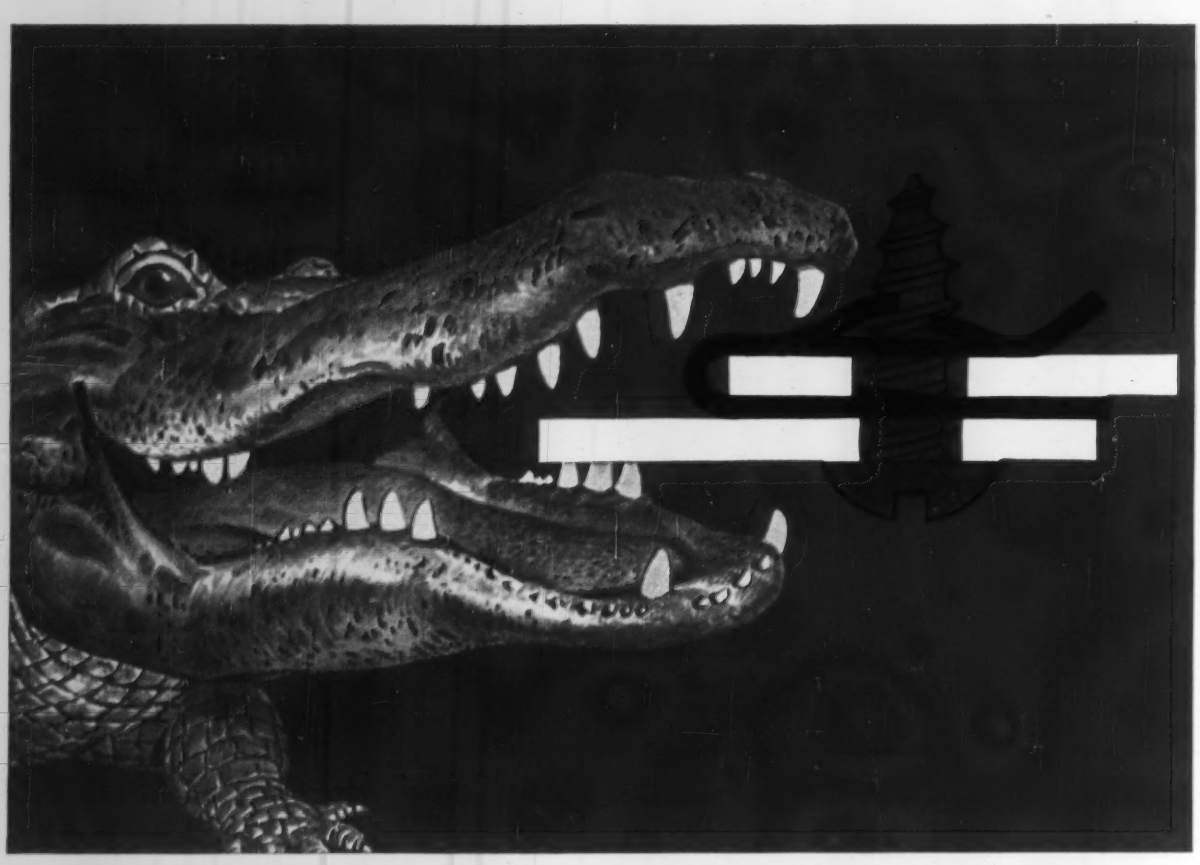


Somers Thin Strip now
Gauged by Nuclear Energy

To meet the increasing demands of electronics and other industries for *uniform* closer tolerances, Somers Brass has taken advantage of one of the latest developments in the electronic field by installing the first Accu-Ray gauges in the non-ferrous industry. These units make it possible to check and control thickness from edge to edge throughout each coil to a degree of accuracy never before known.

Accu-Ray gauging is typical of the modern methods Somers combines with engineering experience to provide thin strip metal to your most rigid specifications. Nickel, Monel, and Nickel Alloys from .020" to .00075". Brass, Bronze, Copper and Alloys from .010" to .00075".

FOR EXACTING STANDARDS ONLY
Somers
Somers Brass Company, Inc.
104 BALDWIN AVE., WATERBURY, CONN.



STEEL JAWS THAT NEVER RELAX

fasten a fastener in place

Alligator jaws have nothing on Tinnerman "U" and "J" type fasteners in gripping power. These fasteners press easily into locked-on position over panel edge or center panel locations. Yet they provide positive self-retention, ending the need for welding, staking or other secondary fastening devices. They are ideally suited for blind assembly or hard-to-reach locations.

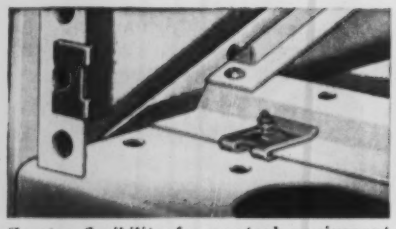
When combined with the familiar Tinnerman SPEED NUT, this unique fastening principle provides a one-piece, self-locking, self-retaining fastener that is fast and easy to apply. The "U" or "J" feature can be combined with wire and tube retainers, latches, catches and a host of other fastening requirements to save time, material and production costs.

Find out about these and more than 8,000 other types of SPEED NUT brand fasteners now serving industry all around the world. They can make important savings for you, can also simplify your assemblies. See your Tinnerman representative soon or write to us. **Tinnerman Products, Inc., Box 6688, Dept. 12, Cleveland 1, Ohio.**

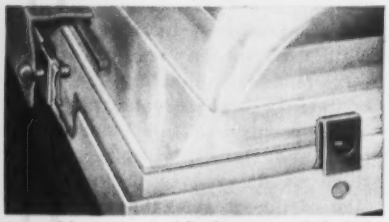
TINNERMAN

Speed Nuts®

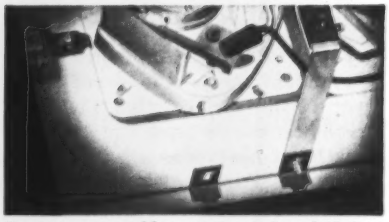
FASTEST THING IN FASTENINGS®



Greater flexibility for control equipment enclosures is provided by self-retaining "J" type SPEED NUTS at 30% less production cost.



Assembly costs on this sheet-metal skylight frame are reduced 66% by Tinnerman "U" type SPEED NUTS.



Gas range assembly costs are reduced 25% to 50% by using Tinnerman "U" and "J" type SPEED NUTS.

HERBERT W. FICHTNER
. . . Atrax Co. sales manager

Herbert W. Fichtner was made sales manager, **Atrax Co.**, Newington, Conn. He has been associated with Pratt & Whitney Aircraft as a tool buyer for the last five and a half years.

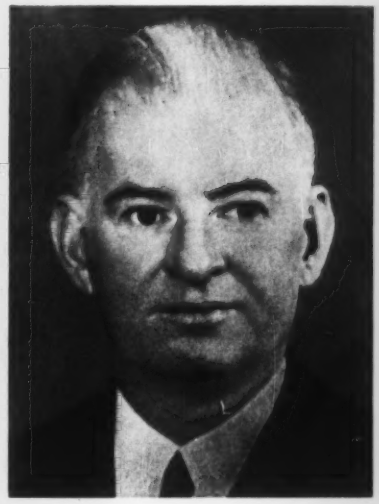
Hill-Chase & Co. Inc., Philadelphia, named **Donald MacCallum** manager of sales. **George J. Ehne** is assistant vice president-sales.

H. S. Conrad was elected president, **Stackpole Carbon Co.**, St. Marys, Pa., to succeed **Lyle G. Hall**, retired. **A. A. Haberberger** was elected vice president-general works manager. **H. A. Williams** was made general manager, electronic components division; **Harrison C. Stackpole**, general manager, carbon division.

Frederick M. Rutledge, formerly chief control engineer, **Hays Corp.**, Michigan City, Ind., was made manager of project engineering.

Dennis Boyle was elected president and treasurer, **Vincent Steel Process Co.**, Detroit. **Charles W. Fritz** was made vice president-general manager; **Thomas H. MacIndoe**, vice president-sales manager.

William H. Smith joined **Perfection Industries Division**, Hupp Corp., Cleveland, as assistant to the heating and cooling sales manager. He was Chicago district manager, Acme Industries Inc.



JOHN F. DOLAN
. . . Lamson & Sessions gen. mgr.-Chicago

John F. Dolan was made general manager of Chicago operations for **Lamson & Sessions Co.**, a new post established to co-ordinate functions of the new Chicago plant and product distribution in the western district. Mr. Dolan was western district sales manager.

Ernest T. Wagar was named assistant works manager, Massena, N. Y., smelting division, **Aluminum Co. of America.** He was production superintendent.

Adirondack Foundries & Steel Inc., Watervliet, N. Y., elected **C. M. Apgar** vice president - operations; **C. L. Richards**, vice president-metallurgy and research; **F. E. Ziter**, vice president-sales; **N. B. Akitt**, vice president-engineering.

Longren Aircraft Co., Torrance, Calif., elected **W. R. Miller** vice president - manufacturing; **Raymond C. Buck**, vice president-customer relations.

A. L. Peake transfers from Los Angeles to Oakland, Calif., as assistant manager of **Kaiser Steel Corp.'s** central district sales office. He succeeds **Mark Anthony**, now assistant to the vice president-general manager.

Ray E. Lewin was made purchasing agent, tractor products, **Allis-Chalmers Mfg. Co.**, Milwaukee.

ARTHUR C. RAE
. . . Atlas Steels Ltd. sales director

Arthur C. Rae was made director of sales, **Atlas Steels Ltd.**, Welland, Ont. He has served as manager of Canadian sales for the last three years. Mr. Rae succeeds **R. M. Davis**, recently made assistant to the president.

General Motors Corp.'s central foundry division, Saginaw, Mich., named **Elmer E. Braun** works manager; **Leslie L. Shafer**, sales manager. **Charles E. Drury** was made manager of the division's Danville, Ill., plant; **Gordon S. White**, manager of the Defiance, O., plant. Mr. White succeeds **F. James McDonald**, now works manager of GM's Detroit Transmission Division at Ypsilanti, Mich.

Henry F. Dever, president, Brown Instruments Division, **Minneapolis-Honeywell Regulator Co.**, has been given corporate responsibility for activities of the parent company in the industrial controls field. He continues to head the Brown Instruments Division, Philadelphia, and has headquarters there. **C. L. Peterson**, vice president - general manager of the division, will direct its daily operations.

Thomas W. Allison was made sales manager of **Aluminum Foils Inc.**, Jackson, Tenn. He was eastern sales manager, New York.

Francis M. Wistert and **Robert E. Valk** were elected vice presidents

READY

SURFACE COMBUSTION CORPORATION, 2408 DORR ST., TOLEDO 1, OHIO

TO ROLL

New batteries of Surface® one-way fired soaking pits go into operation in Texas, where men make big investments and expect big returns

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Benno Schilde Maschinenbau, A. G., Bad Hersfeld

Surface
STEEL MILL EQUIPMENT

A. E. WATTS

W. D. McDONALD

. . . vice presidents at Sun Tube Corp. of Canada Ltd.

of **Electric Auto-Lite Co.**, Toledo, O.

Sun Tube Corp. of Canada Ltd., Ottawa, Ont., subsidiary of Sun Tube Corp., Hillside, N. J., elected **A. E. Watts** vice president-plant operations; **W. D. McDonald**, vice president-sales.

John M. Yahres was named assistant sales manager, **North American Refractories Co.**, Cleveland. He was Detroit district sales manager. **Harry D. Roach** joins the sales force in Chicago.

William D. Wallace will represent **Republic Rubber Division**, Lee Rubber & Tire Corp., in the lower peninsula of Michigan, excepting the Detroit area. He has headquarters in Mason, Mich.

Robert S. Day was named to head the metalworking industries market by **Leeds & Northrup Co.**, Philadelphia.

Lester B. Woolfenden was named manager of **General Aniline & Film Corp.'s** acetylene chemical products plant at Calvert City, Ky. **Dr. Hans Beller**, formerly at the Calvert City plant, returns to New York as acetylene projects director, dyestuff and chemical division.

Owen Kuhen was named product specialist for **Carrier Corp.'s** absorption refrigeration equipment, machinery and systems division, Syracuse, N. Y. **Victor Cole** was made a sales engineer in the southwest region for large air conditioning equipment.

Richard F. Shelley joined **Van Norman Machine Co.**, Springfield, Mass., as chief electrical engineer. He was engineering, sales and marketing manager at General Electric Co.'s Bloomington, Ill., plant, general purpose control division.

Russell S. Rockafellow was made director of production engineering, **Chrysler Corp.**, Detroit. He was chief industrial engineer on the manufacturing staff. **S. M. Baltzly Jr.** was made purchasing agent, Chrysler Division. He joined the division last May after six years as director of purchases at Bulldog Electric Products Co.

Kenneth G. MacDonald was made product sales manager of furnaces and associated equipment in **General Electric Co.'s** industrial heating department, Shelbyville, Ind.

Adm. William M. Fechteler, USN, ret., former Chief of Naval Operations, was named a planning consultant in **General Electric Co.'s** atomic products division. He is located in Washington.

Frederick C. Jones was made manager, regional foil sales, for **Kaiser Aluminum & Chemical Sales Inc.** With headquarters in Cleveland, he covers Cleveland, Cincinnati and Detroit.

Gordon R. Snyder was made Pittsburgh district sales manager for Republic Steel Corp.'s **Berger Division.** He was a sales representative in the Detroit office.

Earl Hottel, formerly with Pennsylvania Transformer Co., was named head of the new service and parts department of **Lectromelt Furnace Co.**, Pittsburgh, division of McGraw Electric Co.

Massey-Harris-Ferguson Inc., Racine, Wis., elected **Harold A. Wallace** vice president-manufacturing; **John H. Shiner**, vice president-marketing. Mr. Shiner was Chicago district sales manager, Lin-

RUSSELL S. ROCKAFELLOW

S. M. BALTZLY JR.

. . . new positions at Chrysler Corp.

V. W. WELLS
. . . *Electric Hose & Rubber v. p.*

CHARLES A. WILLIAMS
. . . *Johnson Bronze v. p.-sales*

coln-Mercury Division, Ford Motor Co.

V. W. Wells was elected vice president and sales manager, **Electric Hose & Rubber Co.**, Wilmington, Del. He was vice president-manager, midwestern division, at Chicago.

P. F. Fowle was elected president, **Westeel Products Ltd.**, Toronto, Ont. Formerly executive vice president, he succeeds **E. S. Sargeant**, who resigned due to ill health.

John T. McCutcheon was made assistant general manager, **Guibert Steel Co.**, Pittsburgh. He continues as production manager.

Lewis F. McNitt was made assistant to the president of **Midland Steel Products Co.**, Cleveland. He joined Midland in 1953 as chief product engineer, automotive frame divisions. Temporarily, he continues headquarters at the Detroit frame plant.

Charles A. Williams was elected vice president-sales, **Johnson Bronze Co.**, New Castle, Pa. Before joining the firm as sales director in 1955, he was general sales manager for Cleveland Graphite Bronze Co.

Louis Allis Co., Milwaukee, named **Fred W. Rosenberg** manager of distributor sales; **Francis Cross**, manager of gear motor sales; **Herbert A. Schreiber**, service manager; **Donald E. Heller**, district manager at San Francisco.

John R. Duffy was appointed chief engineer of **Lindberg Engineering Co.**, Chicago.

General Transistor Corp., Richmond Hill, N. Y., elected **Allan Easton** vice president-sales manager. He was vice president-general manager of Granco Products Inc.

Richard A. Matheis was made Cincinnati district sales manager for **Trane Co.**

Pittsburgh Steel Co. appointed **Byron K. Elder** chief metallurgical engineer-service at Detroit; **Russell M. Kotys**, a metallurgist for the sheet division, Allenport, Pa.

Burgess-Manning Co., **Penn Instruments Division**, Philadelphia, named **R. J. Medkeff** chief engineer; **William Melas**, consulting engineer; **Adalbert Melas**, service manager.

Walter K. Palmer was made manager, Fleetwings Division, **Kaiser Metal Products Inc.**, Bristol, Pa. He remains as assistant treasurer of the firm.

William L. Bruckart, a development engineer in the technical department of **Universal-Cyclops Steel Corp.**, Bridgeville, Pa., was transferred to the special product sales department.

John Finn fills the new post of merchandise manager for **Triangle Steel & Supply Co.**, Los Angeles.

National Carbon Co. named **R. P. Stambaugh** assistant plant manager at Niagara Falls, N. Y., in charge of its works laboratory and instrumentation group. He was head of the product and process control laboratory.

Hapgood Kipp was made Philadelphia district manager for **Simplex Valve & Meter Co.**

U.S. Steel Corp. appointed **Emerson R. Miller** assistant to the general superintendent and **William D. Millar**, division superintendent, coke and coal chemical works and blast furnaces, central operations, Fairless Works, Morrisville, Pa. **R. E. Madden** was made maintenance superintendent, rolling division, to succeed **J. E. Foldessy**, now assistant works chief engineer of the Gary, Ind., Works.

OBITUARIES . . .

Purdum M. Snyder, 54, purchasing agent, **H. H. Robertson Co.**, Ambridge, Pa., died Dec. 4.

John W. Stang, 56, president, **John W. Stang Co.**, Downey, Calif., died Dec. 1.

Herbert Metz, 64, retired eastern district manager, **Graybar Electric Co.**, New York, died Dec. 4.

T. B. Montgomery, 56, chief engineer, electrical application department, **Allis-Chalmers Mfg. Co.**, Milwaukee, died Dec. 7.

William C. Daniels, 52, superintendent, mechanical department, in the Lackawanna, N. Y., plant of **Bethlehem Steel Co.**, died Dec. 6.

C. F. Ramseyer, chairman, **Ramseyer & Miller Inc.**, New York, died Dec. 9.

John F. Shea, 51, vice president-sales, **Becco Chemical Division**, Food Machinery & Chemical Corp., Buffalo, died Nov. 26.

Harvey Activates 8000-ton Press

New unit permits Los Angeles plant to forge larger precision parts for aircraft and missiles

PRECISION forgings needed at key structural points for present and future aircraft and missiles are being produced on a new press at the Harvey Aluminum plant in Torrance, Calif. These close tolerance aluminum forgings minimize machining and provide maximum strength.

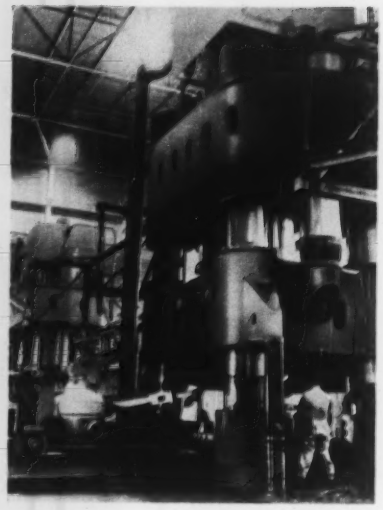
The hydraulic press (shown at right) is capable of applying 8000 tons of pressure. It offers greater capacity for the production of non-military aluminum forgings, such as automobile and truck wheels.

No Machining—One in a battery of new hydraulic forging presses in operation at the Los Angeles area facility, this unit makes it possible for Harvey to forge larger conventional parts and parts with greater precision. The tremendous pressure exerted is used to get zero-degree draft angles, thinner webs and ribs and reduced fillet and corner radiuses. Weight is decreased. Machining is eliminated.

The size of the press is indicated by these specs: Over-all height, 53 ft (35.5 ft above floor level); working stroke, 6 ft; die area in which forgings can be produced, 9 x 6 2/3-ft.

The press incorporates a four-column, three-cylinder design, enabling it to operate at 3000 or 8000 tons of force. The extreme rigidity of its construction makes it possible to produce difficult asymmetrical forgings without destroying the alignment of the press or impairing forging tolerances.

Equipment and facilities supporting the presses include: Die-sinking shop, trim presses, straightening presses, heat treating furnaces, billet heating furnaces and automatic ultrasonic testing units.



Ford To Open Assembly Plant

Ford Motor Co., Dearborn, Mich., is rushing a new assembly plant at Claycomo, Mo., into production. (It's 12 miles northeast of Kansas City, Mo.) Operations are expected to start soon after Jan. 1, ahead of schedule. When this new facility gets under way, production will be halted at the old Kansas City assembly plant. The Claycomo plant was producing wings for B-47 stratojets.

Gets Rod Mill Equipment Award

Dravo Corp., Pittsburgh, has been awarded a contract by Blaw-Knox Co., that city, for four Dravo-DeLaval mill lubrication systems. They are for installation on rod mill equipment at Keystone Steel & Wire Co., Peoria, Ill.

Brown Fintube Forms Subsidiary

Brown Fintube Co., Elyria, O., maker of finned tubes and a wide variety of fin tube heat transfer products, formed a subsidiary, Brown Thermal Development Co. It will design, manufacture and sell heat transfer equipment for waste heat recovery, recuperation, and air and gas heating by direct fire. The Fired Heater Division will be incorporated into the new company.

Piasecki Aircraft Buys Plant

Piasecki Aircraft Corp., Philadelphia, acquired the 330-acre plant, machinery and other physical assets of Bellanca Corp.'s Aircraft Division in New Castle, Del. This property increases Piasecki's manufacturing capacity tenfold. It solves immediate production requirements and part of its expansion needs. The firm plans to add 100,000 sq ft to its Philadelphia plant. Operations of the Delaware facility will be under the direction of James H. Manning.

More Electrocoated Steel

Pittsburgh Steel Co., Pittsburgh, will modernize and expand electrocoating facilities at its Thomas Strip Division plant in Warren, O. The project will increase production of electrocoated steel about 11,000 tons annually over present capacity which is about 98,400 tons. Several new electrocoating lines will be installed, and present units will be renovated. Work is scheduled for completion late in 1957.

Gets Copying Lathe Rights

Cone Automatic Machine Co. Inc., Windsor, Vt., has taken over the manufacturing and sales rights of the H.E.B. pilot automatic copying lathe for the U.S. and Canada. This was done under a licensing agreement with H. Ernault Batignolles, French machine tool builder.

Borg-Warner To Build Factory

Borg-Warner Corp., Chicago, plans to construct a plant in Auburn, Ind., to house the Warner Automotive Parts Division. The factory will contain 162,000 sq ft, including 16,000 sq ft for office space. Considerable new equipment will be installed for the manufacture of new products.

Perfection Industries Expands

Hupp Corp.'s Perfection Industries Division, Cleveland, will build a 28,000 sq-ft warehouse at the site of its Waynesboro, Ga., plant. Storage space will be converted to production uses. John Gardner is vice president of Perfection and general manager of the Georgia plant.

Forms Vacuum Coatings Inc.

Industrial Solvents & Chemicals Inc., Wilkinsonville, Mass., formed a new division, Vacuum Coatings Inc., to handle and formulate finishes for vacuum metallizers.

Metal Screens Corp. Organized

American Screen Products Co., Miami, maker of aluminum screens and hardware, established a new subsidiary, Metal Screens Corp. Louis Cayll is president and general manager of the new organization. The parent firm is relocating its corporate, sales, design and engineering offices in Elmhurst, Ill. Temporary headquarters will be occupied in that city in January until a 6000 sq-ft office building is completed. Its Chatsworth, Ill., plant is being enlarged.

Youngstown Mfg. To Open Plant

Youngstown Mfg. Co. Inc., Youngstown, will begin full scale operations at its Louisburg, N. C., plant on Jan. 1. This will double the company's production facilities, giving it an extrusion and smelting capacity of about 2 million lb of aluminum a month. The plant has facilities for fabricating, heat treating and extruding aluminum and rolling stainless steel molding. The company recently purchased the Fold Moulding Co. in Louisburg.

Tincher Products Renamed

Tincher Products Co., Milwaukee, a division of Ideal Industries, Sycamore, Ill., will change its name to Imprex Division on Jan. 1. The division makes equipment designed to eliminate porosity in all types of pressure castings.

Starts New Production Line

Quaker State Metals Co. is now producing reflective aluminum insulation which is asphalt laminated at its main plant in Lancaster, Pa.

Commercial Metals Co. Inc.

Commercial Metals Co., Dallas, formed a subsidiary, Commercial Metals Co. Inc., with offices at 416-417 Kresge Bldg., Norfolk, Va. Richard S. Barron is in charge of the Norfolk office. The parent company operates nationally and internationally. Its products include scrap iron, relaying rails, railroad parts and equipment and nonferrous metals.

CONSOLIDATIONS

Chesapeake & Ohio Railway, Cleveland, acquired a substantial financial interest in **Slick Airways Inc.**, Dallas. The airline will increase its capacity to handle its growing business. Slick is a scheduled common carrier of freight, express and mail. It also flies cargo and passengers and overhauls and services aircraft and aircraft engines.

Knapp-Monarch Co., St. Louis, purchased **Metalcraft Mfg. Corp.**, Memphis, Tenn., and will operate it as a division. Metalcraft's line of camping equipment will be expanded.

NEW ADDRESSES

Landis Machine Co., Waynesboro, Pa., moved its Detroit office to 12806 Fenkell Ave., Detroit 27, Mich.

Bethlehem Pacific Coast Steel Corp., Bethlehem, Pa., moved its Portland, Oreg., office to 1010 S.W. 14th Ave., that city. L. S. Kuhn is district manager of sales.

Stith Inc., manufacturer of aircraft assemblies and gear boxes, moved to enlarged quarters at 4056 Del Rey Ave., Venice, Calif.

ASSOCIATIONS

George G. Raymond Jr., president, Raymond Corp., Greene, N. Y., was elected president of the **Material Handling Institute** for a second term. Robert L. Fairbank, vice president, Towmotor Corp., Cleveland, was re-elected vice president. New second vice president is Eugene Caldwell, vice president, Hyster Co., Portland, Oreg.

Plumbing Brass Institute, Pittsburgh, elected these officers for 1957: President, K. C. Bulkeley, American Sanitary Mfg. Co., Abington, Ill.; first vice president, J. D. Clemens, Hays Mfg. Co., Erie, Pa.; second vice president, J. H. Pimm, Bridgeport Brass Co., Bridgeport, Conn.; treasurer, G. C. Harper, Burlington Brass Works, Burlington, Wis.

Wrought Iron Pipe Used for Cable Crossing Project

This 5-in. wrought iron pipe is joined with sleeves which are 12 in. long, then welded. The pipe, produced by A. M. Byers Co., Pittsburgh, will carry high voltage cables of the Wisconsin Electric Power Co. under the Milwaukee river to Milwaukee's heavily industrialized south side. The project required 7200 ft of pipe with numerous bends. Some were as much as 45 degrees

FREE! YOUR NEW ACTUATOR and SPLINE "PROBLEM SOLVER"!

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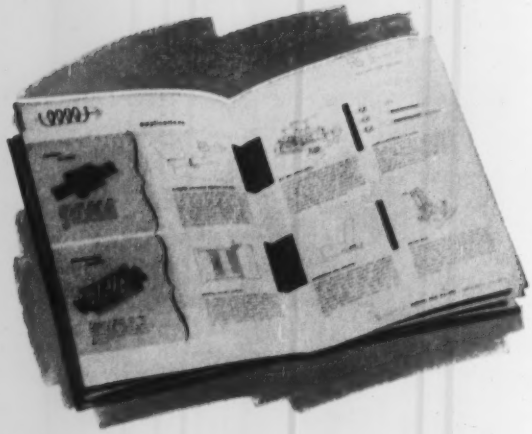
36 pages crammed with time-, work-, and money-saving facts: Principles • Types • Basic Operations • Coupling Methods • Efficiency • Versatility • Advantages • Selection Factors • Design Data • Sample Problems, etc.



SAGINAW b/b SCREWS are *90%-98% efficient* (compared to 15%-20% efficiency of Acme screws). Require ⅔ LESS torque and power for same linear output—with consequent weight, space reductions. Function normally at −75° to +250° F. Two types: precision-ground or commercial rolled-thread. Have been built 1½ in. to 39½ ft. long.

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STEEL
December 24, 1956

Technical Outlook

SALVAGE TITANIUM SCRAP— Mallory-Sharon Titanium Corp., Niles, O., will build a large pilot plant to test a new electrolytic process which recovers titanium scrap. All grades are refined, producing large crystals of high purity metal which can be used in regular ingots. (Elongations to 60 per cent have been reached.) The high quality of refined scrap may even lead to new uses of the metal, predicts James A. Roemer, Mallory-Sharon president.

CERAMICS AND CREEP— Results of a National Bureau of Standards study indicate that under some conditions a refractory-type ceramic coating can reduce the creep rate as much as 50 per cent. Two 80Ni-20Cr alloys were tested; various combinations of stress and temperature were imposed. The greatest reduction in creep rates was observed at 600 and 1200 psi at 1975°F.

MORE ELECTRICITY— Copper - cored nickel tubing carries 40 per cent more current than solid nickel rods, says Jeffrey Mfg. Co., Columbus, O. They are better than bare copper in corrosive mine environments. Better conductivity means smaller rods, which save space, and cooler operation, which adds life to insulation.

CARBON STEEL REACTOR— Use of organic compounds (monoisopropylbiphenyl and biphenyl) as a coolant-moderator for atomic power plants may make carbon steel a suitable construction material for reactors because there's no corrosion, reports Monsanto Chemical Co. Tests also show that the compounds pick up little radioactivity, so heavy shielding of external parts may be reduced or eliminated. The simpler, cheaper installation should produce electric power at lower cost, says Malcolm McEwen of Monsanto's Dayton, O., laboratory.

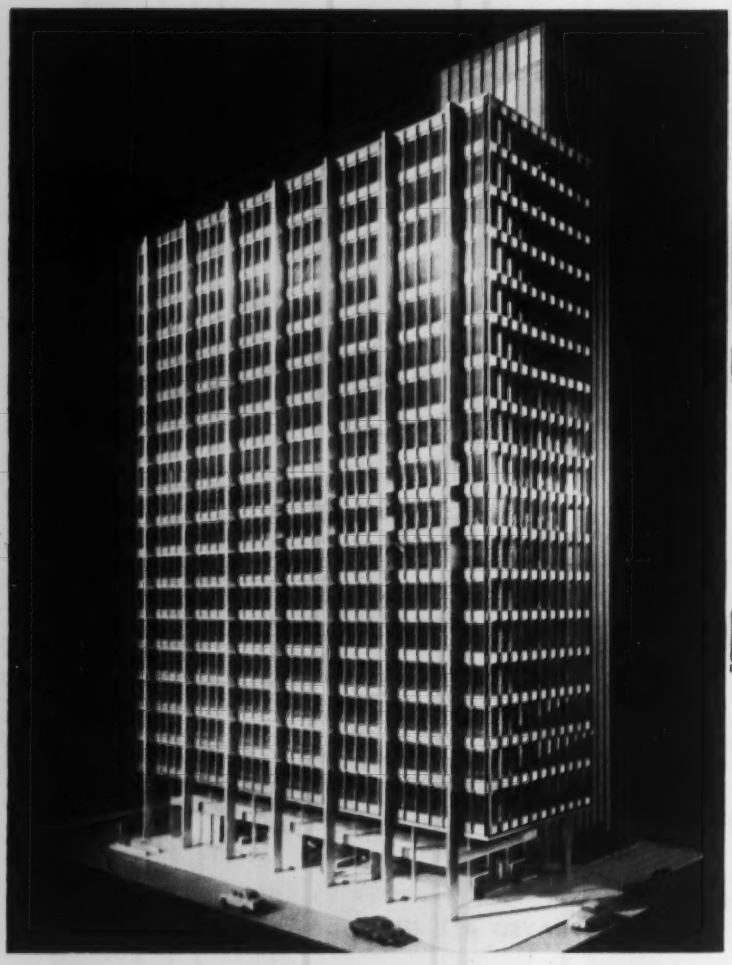
CASTING DEFECTS— Discontinuities in iron and steel castings which are shown up by the dry powder magnetic particle method now can be classified. The ASTM has published 47 reference photos (price: $2.50) covering linear discontinuities (hot tears and cracks), shrinkage, inclusions, internal chills and unfused chaplets, porosity, weld defects, false indications and magnetic anomalies. The Steel Founders' Society of America obtained the photographs from member companies.

SPRAYED ALUMINUM— Servel Inc., Evansville, Ind., uses sprayed aluminum to improve heat transfer in its gas refrigeration units. The walls of the piping are tack welded where the heat transfer is to take place. The joint is built up with sprayed aluminum to provide an effective heat transfer "bridge."

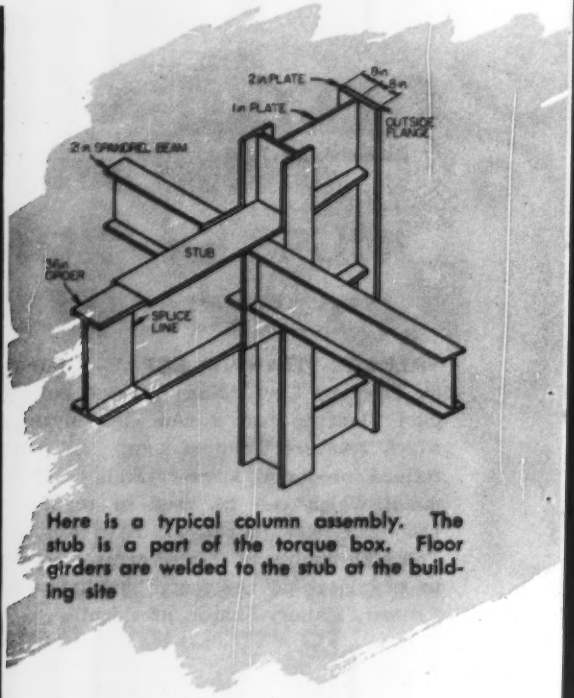
LOOKS LIKE BRASS— A tough, gold-dipping lacquer gives a brass-plated look to parts dipped in it, according to its makers, Dodson Industries Inc., Kansas City, Mo. It is designed for inexpensive metal furniture. The formula uses half-second butyrate that's pigmented with metal powder. Its pot life is unlimited.

COMFORTABLE CRANES— Operators of piercing mill and soaking pit cranes work in solid comfort at Timken Roller Bearing Co., Canton, O. The company has equipped its 14 cranes with air conditioning units.

Metalworking Outlook—p. 27 Market Outlook—p. 79



Inland Steel's new offices will look like this when completed. All 14 supporting columns are outside the building



Here is a typical column assembly. The stub is a part of the torque box. Floor girders are welded to the stub at the building site

This Building

Its columns were assembled in the shop from girders, beams and plates up to 3 in. thick. Automatic, submerged arc welding produced clean, tough joints with a minimum of warping

CHICAGOANS are watching welders erect a unique structure: Inland Steel's 19-story office building.

Its outstanding feature: There are no interior supporting columns. Each floor (approximately 57 x 175 ft) rests on seven 60-ft girders welded to 14 steel columns which are outside the outer face of the building.

Construction—Each external column will be enclosed in a concrete box and sheathed with stainless steel on the three exposed sides. Each one is fabricated from 26-ft lengths, the ends of which are milled square to provide a solid bearing face. Splice plates will be welded over each joint, although there will be continuous bearing from foot plates to roof end.

You can get an idea of the welding problems from the size of the plates. Main webs are $\frac{5}{8}$ to $1\frac{1}{2}$-in. thick; the outside flanges (see illustration) are 1 to 3 in. thick. There are more than 150 column lengths, most of them 26 ft long, requiring eight, full-length welds.

Not many structural steel plants have the facilities for such welding. Inland Steel Co. is the parent firm of Joseph T. Ryerson & Son, whose Chicago plant has a shop large enough to do the job.

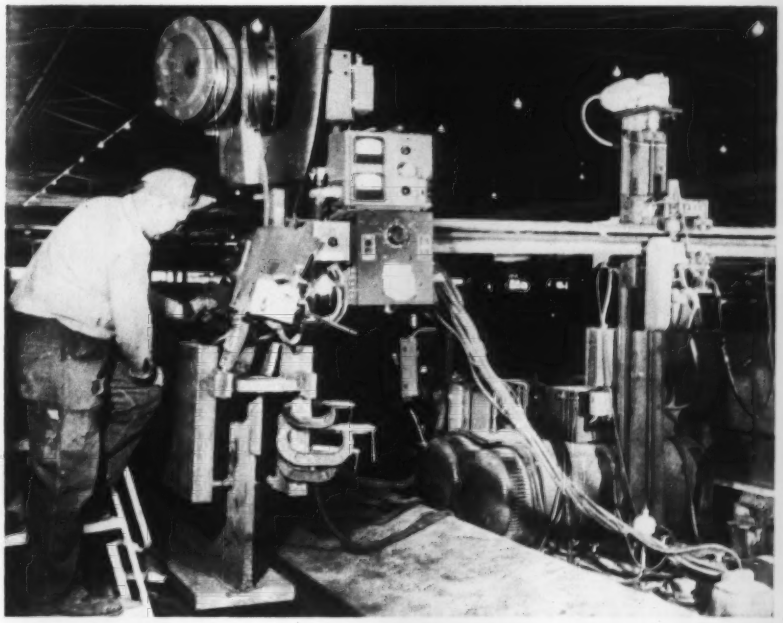
Automatic—Most of the column welding is done with a universal ram type welder, equipped with a Lincoln Electric Twinarc head. Current is supplied by two, 750-amp generators which are mounted on the carriage.

Speed is adjustable; its easy to make welds parallel to the track. Twin arcs, each fed with $\frac{1}{8}$-in. wire, permit unusually rapid metal deposition.

Edges of plates are beveled; the depth and size of the groove and fillet determine the number of passes needed.

At each side of the track there is a bed to support the columns to be welded. Four 26-ft columns are set up at one time. Beds are so arranged that the plates can be set at the most convenient angle.

Submerged — Arcs are covered



This is the universal, ram-type welder (C. C. Peck, Cleveland) which made the long welds in the Ryerson shop

Is Welded

with granular flux that is fed automatically. Unused flux is picked up by a vacuum system on the carriage of the welding machine. The pick-up nozzle is only a few inches back of the electrode. Normally, the machine is operated by two men, one of whom keeps the weld surface free of slag when additional passes are required. He also keeps the head hopper filled with flux.

For exceptionally heavy beads, head travel is 7 to 9 in. a minute; lighter beads are run at 30 in. a minute. During cold weather, an acetylene torch is used in advance of the head to eliminate moisture and preheat the metal.

Welding is done as fast as possible to reduce the spread of heat and minimize warpage. With such heavy welds, there is some warpage which is removed by straightening. Cooling time between passes does not leave the machine idle: It is shifted to other columns. Welds are high grade; the high current density produces excellent penetration.

Backup—On some of the heaviest columns (like the one shown on this page), the thick central plate is beveled on one side only because the inside edge of the box is not accessible. To prevent burn-through at the thin edge, a narrow $\frac{5}{8}$-in. bar is tacked to each side plate before the heavy slab forming one side of the box is put in place.

Run-out plates are used at the end of long welds to insure sound welds. Column ends are machined afterward. End cuts insure square ends and precise length.

Longitudinal welds on all of the heavier columns are made by the automatic machine. It is supplemented by a Lincoln semiautomatic welder mounted on a travel carriage which is used on work with a beveled bed. This welder also makes longitudinal welds on the lighter columns (those for upper floors of the building).

Transverse welds are necessary on some heavy slabs. Plates about 21 ft long are joined after the ends have been beveled. Many beads are required to fill the V-grooves in these welds.

Semiautomatic—For the average longitudinal weld in the lighter columns, the carriage speed of the semiautomatic is usually about 10 in. per minute for the first pass, 12 in. per minute for the second and 16 to 18 in. per minute for the third. Less metal is applied per minute and per pass with the semiautomatic welder than with the automatic. Welds are of equal quality and are made rapidly without preheating. Some warpage is produced, which is minimized by the short heating time and, in some cases, by clamping flanges of duplicate columns back to back.

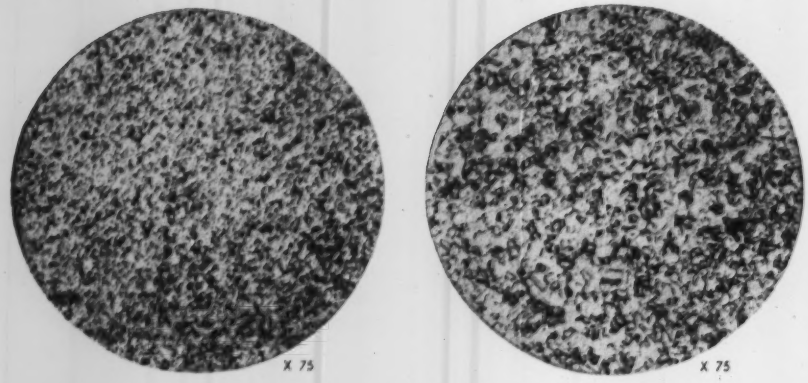
Torque box plates resist torsional stresses set up by wind loads. These are the joint assemblies between columns, floor girders and spandrel beams that are at right angles to both columns and floor beams (illustration, page 64).

Each box has a stub beam that becomes a continuation of the floor beam. It is buttwelded when the building is erected, and supplementary plates are arranged in a cellular or boxlike pattern for welding to the column and to the ends of spandrels. These are welding brackets for floor girders and spandrel beams.

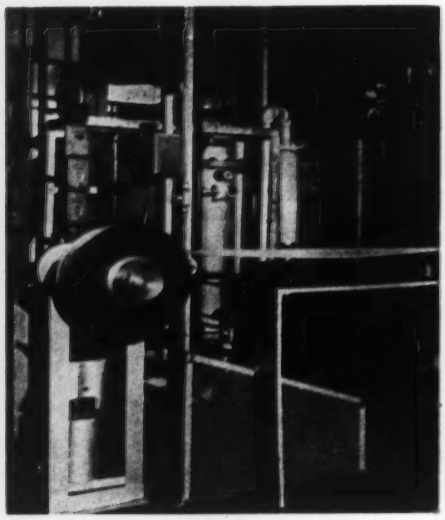
Welding of torque boxes is similar to that on stiffening plates in girders and columns. It is welded partly by hand and partly by a semiautomatic welder which can be used on a travel carriage or guided by hand. Used chiefly on the longer joints in the box, it can be applied only in horizontal positions. It is faster than ordinary hand torches and affords better penetration. Torque boxes are not large structures; it is easy to change their position.

On the Job—Comparatively little welding is required in the building. The chief joints are those transverse to the girders where ends are joined to stub beams in the torque boxes. The welds are made by hand in V-grooves at the ends of top and bottom flanges of girders.

Horizontal splices are made after temporary splice plates are applied. The floor girder flanges are continuous from column to column over a span of nearly 60 ft. Web plates of girders are joined to the mating webs of the stub beams by vertical arc welds. Girder webs are also continuous from column to column.



Compare these grain sizes. The high speed, continuous material is at the left; a typical batch anneal is at the right. The fine grain (left) is smaller than the minimum size (0.015 mm) shown in ASTM standard micrographs



Fine Grained Brass for Deeper Draws

CONTINUOUS annealing of brass strip is bringing about the revision of an axiom—that you need a coarse grain for deep draws. The process, said to be the fastest in the industry, makes strip with the fine grain needed for high finishes and the superior ductility essential to deep draws.

The process is in operation at the Somers Brass Co., Waterbury, Conn. A single brass strip, 0.004 to 0.020-in. thick, passing through a vertical furnace at speeds up to 190 fpm, is heated to annealing temperature in a few seconds and immediately quenched. Most of the production is used in eyelet presses which make lipstick containers, fountain pen caps and similar deep drawn articles.

Compromise—Strip with coarse grain, when drawn, has a rough, orange-peel surface that is difficult to polish. Conventionally processed brass for deep draws is a compromise between a coarse grain for ductility and a fine grain for improved appearance.

In addition to fine finish, you get ductility and increased endurance with continuous annealing. In a study published by the American Society of Mechanical Engineers, H. L. Walker and W. C. Craig show that the endurance limit of continuously annealed brass for 10 million cycles of completely reversed stress is almost doubled by reduced grain size (from 0.024 to 0.004 mm). This is important for diaphragms, or for parts where vibration is a big factor.

Comparison — Control of grain size by any annealing method depends on the regulation of the time-temperature cycle. Batch annealing of coils requires hours to avoid overheating outside areas. Since time is extended, temperatures must be low (800°F for fine grained red brass).

Cycles are selected to develop an equilibrium grain size since portions of the coil are at peak temperature for widely varying periods. The result is a variety of grain sizes with a corresponding variation in mechanical properties.

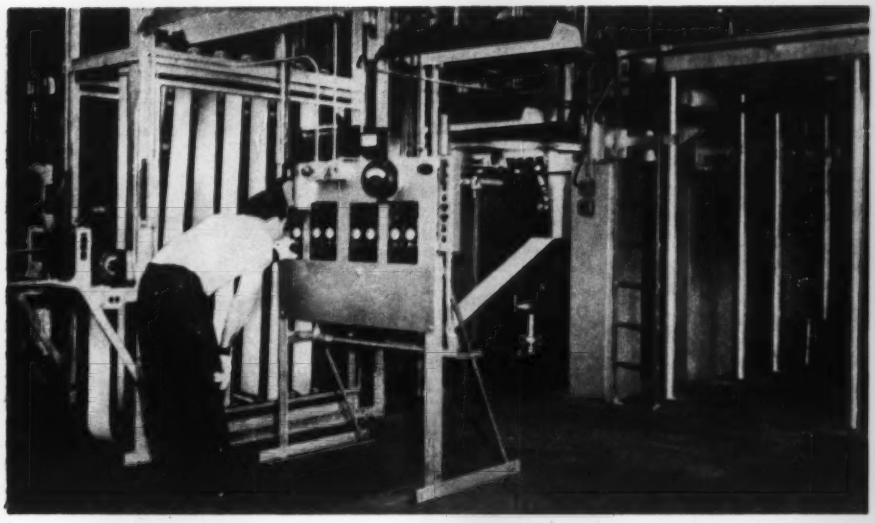
Growth—Consider the mechanism of recrystallization. In brass, it is a process of nucleation and growth of new grains which replace old, strained grains.

A grain nucleus forms at a point of high stress concentration. High energy points are the least stable, and during the annealing cycle, they are the first to be relieved.

Following the formation of a nucleus, the grains coalesce, gradually growing by combining with other grains. (The rate of nucleation and coalescence is varied by time and temperature.)

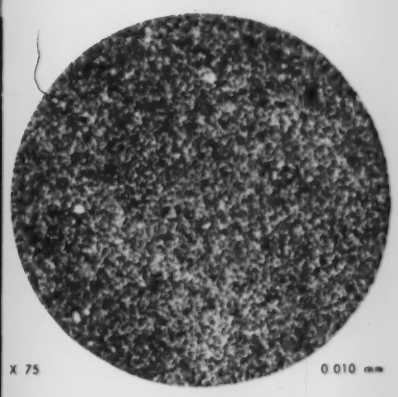
To get a fine grained structure in coil annealing, the nucleus formation rate must be accelerated and the rate of grain growth retarded. Nucleus formation is accelerated by increasing the numbers of high stress points through increased cold work. Grain growth is retarded by keeping the temperature down. This makes it uneconomical to complete recrystallization. Effect: Remnants of strained grains which prevent highest ductility.

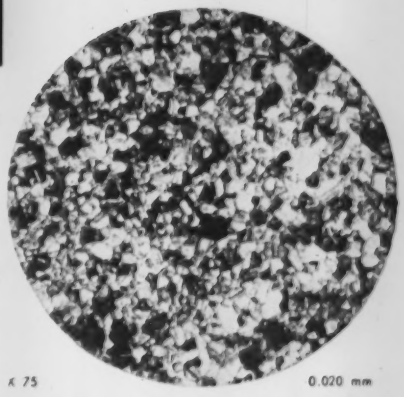
Fast But Fine—The continuous annealing process heats the strip in less than 10 seconds. Strip temperature is high before nucleation starts. Result: Complete nucleation at all points in the



Exit end of the Selas continuous annealing furnace, showing the control panel. As the production speed is increased, furnace temperature is increased. Strip is quenched before exposure to air

You don't have to sacrifice ductility to get a high finish with continuous annealing. It also reduces zinc loss, doesn't call for special atmosphere





How iron content (0.115 per cent) in 70-30 brass affects grain size. Photomicrograph (top) is for continuously annealed strip. The one on the bottom is from a batch annealed strip (1000° F for 40 minutes and re-annealed at 1020°F for 40 minutes)

strip. Recrystallization is also complete before grain growth gets started. To insure that there is little or no grain growth, the strip is quenched.

Another Advantage — In the batch annealing of cartridge brass, impurities (notably iron) make close control of grain size difficult. That's why an upper limit for iron (0.05 per cent) is usual.

Generally, iron has little or no effect on recrystallization, but it does retard grain growth at the usual batch-anneal temperatures. At higher temperatures, the iron goes into solid solution and grain growth is accelerated. That and uneven coil temperatures produce an erratic, coarse grained structure.

At Somers Brass, recrystallization is fast and at high temperature, with the iron in solution. Temperature uniformity and close time control give a uniform anneal and grain structure in spite of high iron content.

Scallops — Another problem of the batch anneal is surface loss of zinc. Called scalloping, it is confined principally to the exposed edges of a coil where adjacent laps are not tight enough. The discoloration can be partially removed by pickling, but complete removal may require buffing.

Continuous annealing requires no externally prepared atmosphere since the combustion gases are nonoxidizing to copper and its alloys. Air and gas for firing the burners are premixed to eliminate oxygen in the products of combustion. The furnace operates under positive pressure. Heating time is so short that zinc loss is negligible.

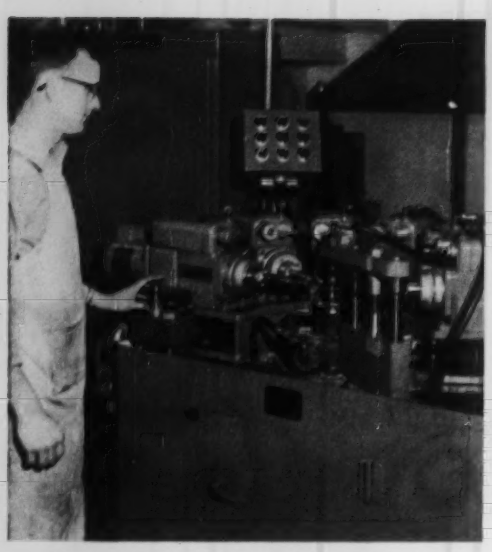
Construction — Somers Brass uses a vertical furnace designed by the Selas Corp. of America, Dresher, Pa. The strip passes between two sections with refractory walls studded with radiant cup burners.

A combination of steam and hot water is used to quench the strip.

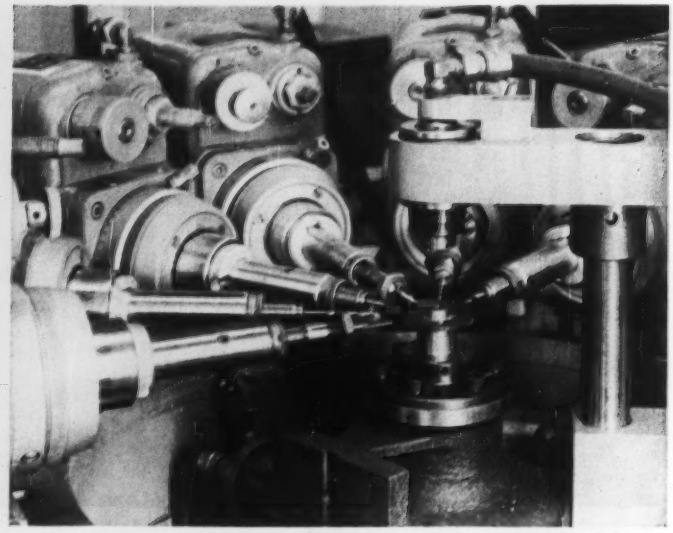
• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.

This is how the physical properties of brass strip compare when annealed by the batch or the continuous strip methods. How well brass strip will absorb work hardening in cold reduction is shown by the extent of elongation in the tensile test.

	Red Brass Batch	(85-15) Continuous	Yellow Brass Batch	(70-30) Continuous
Grain size (millimeters)	0.020	0.010 max	0.020	0.010 max
Tensile strength, psi	46,000	47,000	56,000	45,600
Elongation, per cent	40	49	45	55
Hardness, Rc-T scale	30/40	39/41	36/45	39/40



Handling as many as 300 different but similar parts, this machine spot drills, tap drills and taps. It also broaches center holes



Close-up of the tool area shows drill units in pairs. Nos. 1 and 4 (from the right) are spot drills, 2 and 5 are tap drills and spindles 3 and 6 are taps. The clamping arm is raised off the part

Index Machine Triples Output

It turns out a wide range of similar parts automatically. A series of six air-feed electric drill units and an under-the-table broach are primary features

GEARS, spacers and other small cylindrical parts make up a large portion of an instrument maker's production. At Leeds & Northrup Co., Philadelphia, tool engineers have been looking for an escape from excessive tool and production duplication in handling these parts.

A. M. Knorr, L&N tool engineer, says: "The parts usually are similar to the extent that each has an accurate (to 0.001 in.) center hole and two setscrew holes located at right angles and perpendicular to the axis of the center hole."

Solution—L&N engineers found they had as many as 300 different but similar hubbed gears and other parts. They were machined in separate drill jigs and hand operated drill presses—then broached or put through a punch press to remove burrs from the center hole.

Coupling these operations so the whole range of parts could be done automatically on the same machine set up versatility as a prime target. The offspring of the search for the right production method is a custom-built index unit that drills, taps and broaches all parts in one cycle.

The machine was designed at the George Garwood Co., Philadelphia. It uses six air-powered hydraulic drill units built by the Hartford Special Machinery Co., Hartford, Conn. Three adjustments provide positive control of length of rapid approach, rate of feed and depth. Easily adjustable spindle speeds make it possible to handle the wide range of parts.

Pairs—The drill units are spaced on the machine at 30-degree angles. They work in pairs (90 degrees between the two) to center drill, tap drill and tap. The broaching cylinder is beneath the machine table. The broach pilot acts as a locating pin for the part.

During the machine cycle, the broach is driven up and down by an air cylinder, clearing the center hole of burrs.

Operation — Parts are clamped by a cantilever bar that rides on two 1¼-in. diameter guide rods. After the part has been located and clamped, the two center-drill head approach rapidly until the drills are a few thousandths from the workpiece. They slow down to normal cutting feed and cut the desired countersink.

After the first pair of spindles have returned to position, the part automatically indexes 30 degrees and the second pair drills the holes. Then the third pair of spindles tap the holes and the bore is broached.

The machine cost $11,750, including design. It has cut the time to complete the hole preparation and screw assembly from nearly 1 minute to only 11 seconds.

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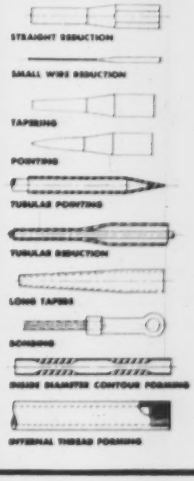
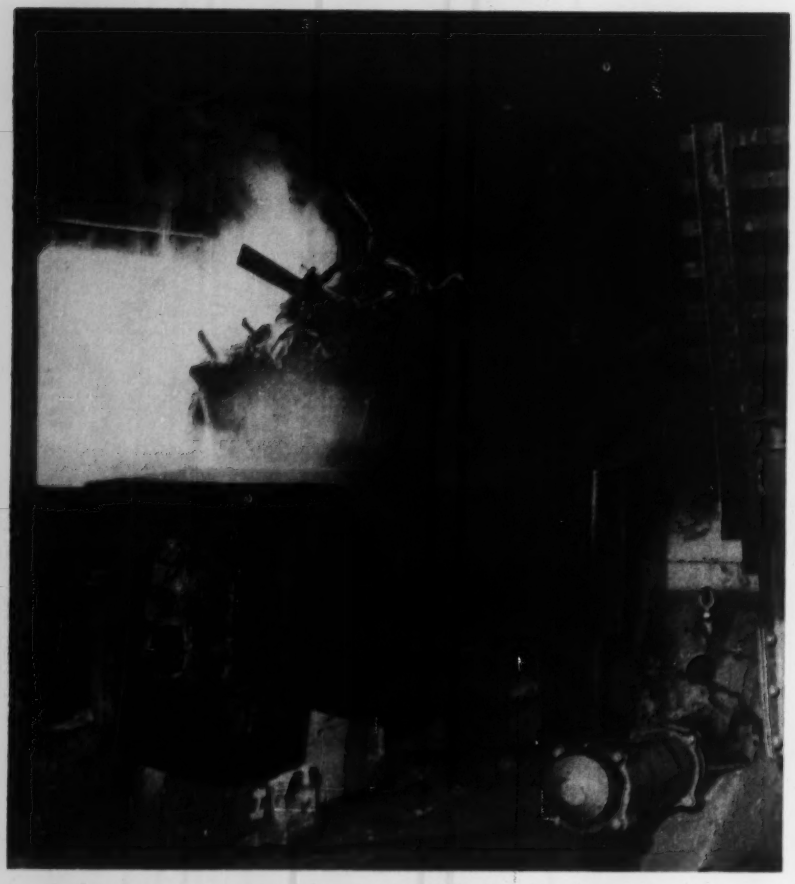




Load of scrap goes in one of the new 5 x 5 ft charging doors

Faster Charge for Open Hearth

Granite City Steel's program for increasing open hearth tonnage includes new 61 cu ft charging boxes, front flushing and firing with high pressure natural gas

CHANGE-OVER to charging boxes of 61-cu-ft capacity and several open-hearth modifications are expected to increase ingot production at Granite City Steel Co., Granite City, Ill.

In addition to cutting heat time, the larger boxes (32-cu-ft boxes were formerly used) reduce floor congestion, allow larger pieces of scrap to be handled and speed stocking scrap in the boxes.

Carry the Load—Converting the company's seven open-hearths—three 285-tonners and four 250-tonners—for charging with the big boxes began in August, 1955, and was completed last March. About 70 per cent of the charges are made with the 61-cu-ft boxes; heavier scrap is charged in the smaller boxes.

During the change-over, some 60 buggies with 180 boxes were used on each heat. With the change-over complete, about 100 boxes are being handled on 50 or less cars. The average charge at Granite City is 64 per cent scrap and 36 per cent hot metal.

Comparison — About one-third more weight is handled in the new boxes than in the old:

Type of Scrap	Old Boxes lb	New Boxes lb
No. 1 R.R. Scrap	1720	2902
No. 2 Heavy Melting	1561	2782
Bundles	2132	3529

Two charges can be made up where three were required before.

New Peels—To handle the new boxes and the old on its three charging machines, the company installed transitional peels. The peel heads are rectangular, so that when they are turned one way, they fit the small boxes; turned the other way, they fit the large boxes.

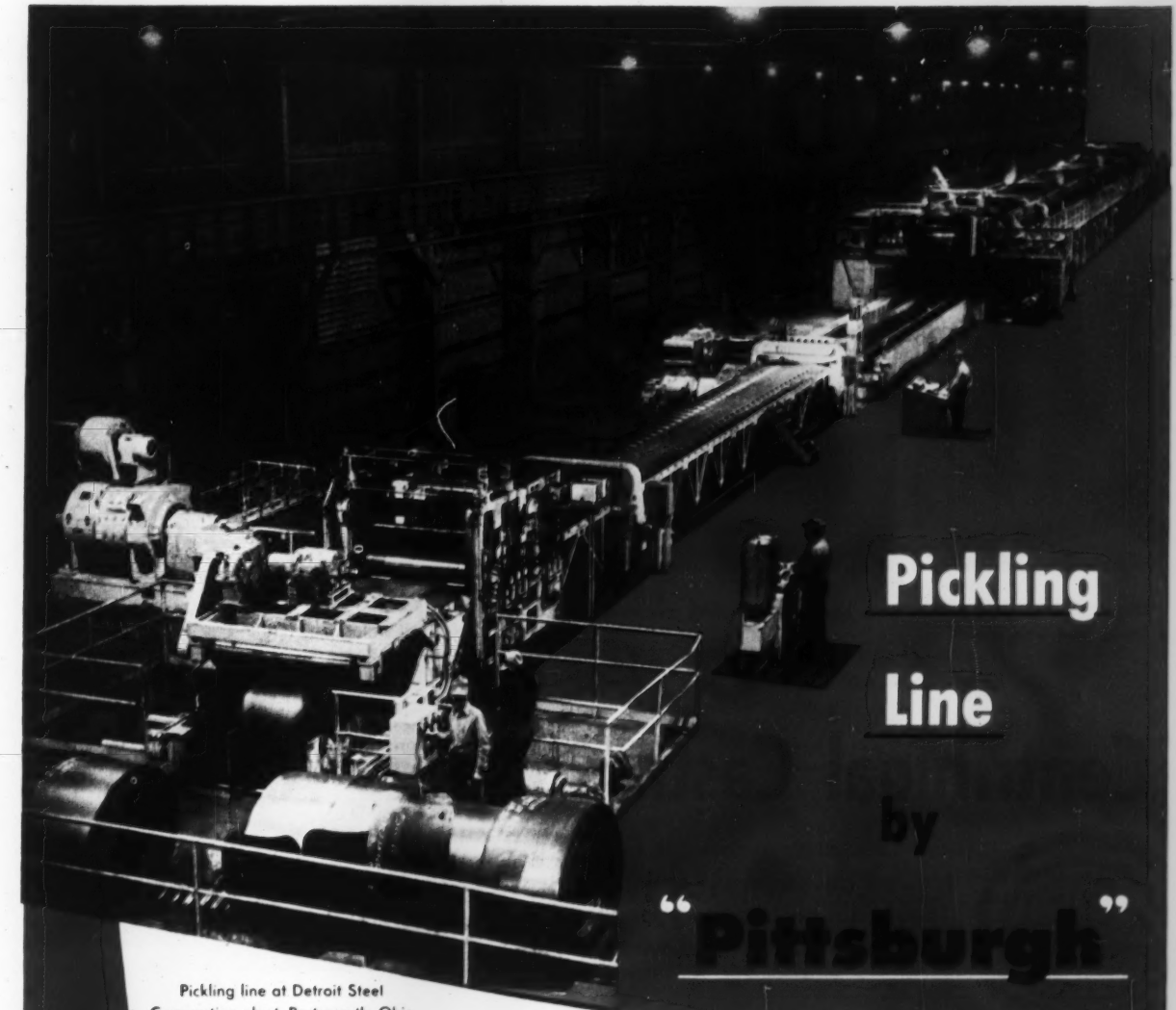
The 4 x 4 ft charging doors were replaced with 5 x 5 ft doors, and furnace roofs were elevated to permit a greater turning radius. This work was phased with the completion of campaigns on each furnace.

Change-Over Time — The first furnace change-over took nine days —six days more than the time normally required to recondition a furnace after a campaign.

On the first conversion, the furnace front was completely disassembled and rebuilt. On the second conversion, and all others, the front of the furnace (it weighs about 60 tons) was stripped as a unit. A prefabricated front with the new, larger doors was tilted into place with hot metal crane hooks. This change in technique cut change-over time to five to six days a furnace.

Fuel Switch—Included in Granite City's program for increasing tonnage are front flushing and a switch from steam atomization of fuel oil to natural gas atomization. When the program is complete, all seven furnaces will be fired with high pressure natural gas at 250 psi and Bunker C oil. The cost per British thermal unit will be lower and the furnaces will run more efficiently, says the company.

Granite City's 200 new charging boxes and the peels for the charging machines were made by Union Steel Castings Division, Blaw-Knox Co., Pittsburgh.



Pickling Line by "Pittsburgh"

Pickling line at Detroit Steel Corporation plant, Portsmouth, Ohio

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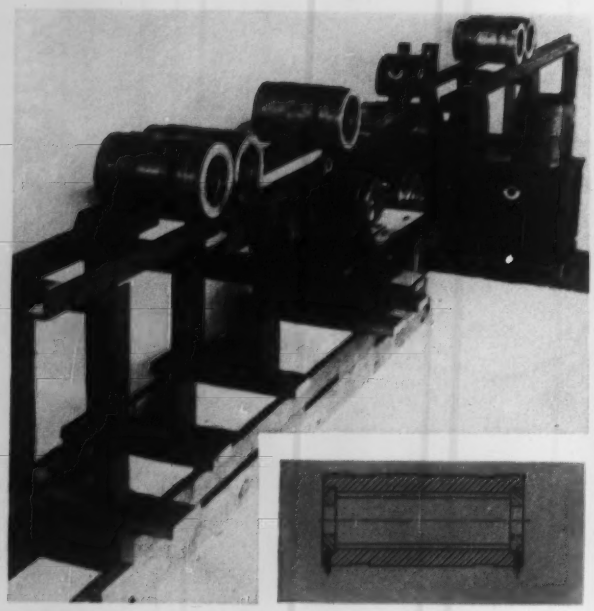
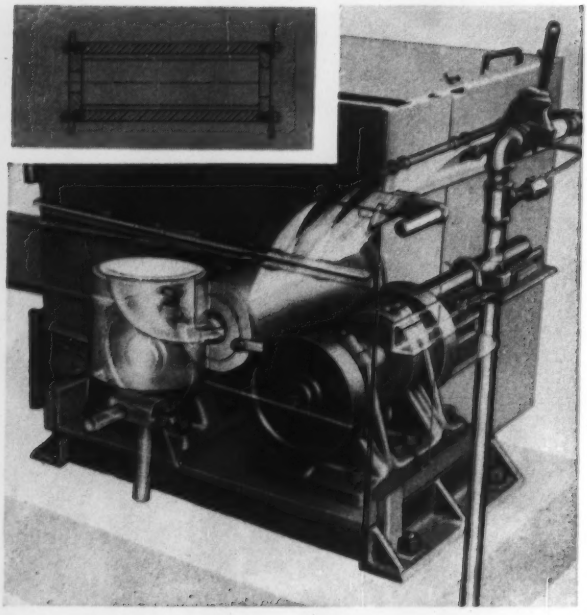


Duplicate cast iron molds on a horizontal casting machine. Inset, cast iron mold



Water-cooled steel mold in casting machine. Inset, typical water-cooled steel mold

Centrifugal Casting Moves Ahead

Newest development is the use of water-cooled steel molds. They can be made from steel tubing to handle castings which are 12 in. in diameter

By NATHAN JANCO
President
Centrifugal Casting Machine Co.
Tulsa, Okla.

TRENDS in centrifugal casting point to greater use of permanent molds and less use of the sand-line, one-shot variety.

With permanent molds, you can make several castings without doing any appreciable work on the mold. Most of them are made of graphite, cast iron or steel. Copper has been used in special applications.

Graphite Molds—This type has high heat conductivity and can be used in relatively thin wall sections. The material also can be used for inserts in iron or steel carriers.

The over-all cost of a graphite mold usually is less than that of a cast iron mold, but about the same as one made of steel. Graphite molds have to be treated carefully.

Cast Iron — It is customary to design this type (left, above) with a mold to casting weight ratio of from 3:1 to 8:1. If much lighter sections are used, the molds are apt to crack and break when the metal is poured.

Usually, it takes considerable time to produce a cast iron mold because you must make a wooden pattern, cast the mold, then machine the casting.

The mold must be nearly perfect on the portion that produces the casting, and it is sometimes necessary to make more than one mold casting to get the required accuracy. This adds to the cost and delay.

Duplicate Molds — To produce centrifugal castings at high production rates, your molds must cool between casts. With cast iron molds, this can be done by using several duplicates (left, above).

A mold is placed in the spinning machine, poured, then taken out. The casting is removed from the mold while it is out of the casting machine. Another prepared mold is put in the machine and the process repeated.

Cast iron molds usually are allowed to cool in air. Water cooling shortens the time required and allows the use of fewer molds, but it may crack them. To produce large quantities of castings at low cost, you must use a large number of duplicate molds.

Steel Molds—The newest method involves the use of steel molds and water cooling (right, above). You can produce most castings under

12 in. OD from heavy walled steel tubing, which is readily available from warehouse stock. Molds made from steel tubing can be produced at low cost and without undue delay.

Water cooling makes the use of these relatively lightweight steel molds possible. You need only one mold for a casting, regardless of the quantity or production rate.

Long Life—Because of water cooling, you don't have to remove the mold from the machine after each casting; simply remove the casting from the mold. Handling costs are reduced considerably.

The usual maximum life of a graphite mold is about 100 castings, cast iron molds 350 to 500. A lightweight steel mold will produce from 1000 to 3000 castings under the same conditions.

Steel cuts down the temperature differential between the inner and outer surfaces of the mold. This reduces stresses and greatly increases mold life. In some types of casting, the molten metal sticks or fuses to the wall of the mold. This is a costly nuisance. Water cooling reduces this tendency.

Raining—It is sometimes difficult to avoid "raining" or considerable agitation of the metal as it enters the mold.

When copper-base alloys are poured, an appreciable amount of dross forms and eventually becomes part of the inside diameter of the casting. In many cases, this means you have to leave a finish machining allowance of ¼ to ⅜-in. on the inside.

Solution—A simple way to eliminate dross is to use natural or bottled gas. The gas is piped into one end of the mold cavity before spinning to displace the air. As a safety precaution, the gas should be lighted.

In keeping the oxygen from the metal, it doesn't matter whether the metal contacts the gas or the products of combustion. When the metal is poured, it will come in contact with only the gas in the runner pots and the mold cavity. This effectively eliminates the formation of the oxide drosses on the inside diameter.

Pouring Rates — High pouring rates are necessary; the metal entering the mold has to cover a large surface area. If pouring rates are low, some of the metal will solidify before all of it has covered the mold surface. This results in cold shuts. Cold shuts or laps also can result if the pouring temperature of the metal is too low.

You can pour too rapidly. Metal can enter the mold at such a high rate that there is no pickup, and it splashes around in the mold cavity while the mold is spinning. This causes excessive dross.

Runner pots with the correct nozzle size for the job eliminate this problem. The ladle man merely pours fast enough to fill up the runner pot and maintain a high level of molten metal in the pot. The nozzle opening of the runner pot controls the rate at which the metal enters the mold.

Runner pots also can be used to control the direction of flow of metal entering the mold—it should be in the same direction as the rotation. The inertia of the flowing metal aids pickup and tends to eliminate raining.

Bimetallics—Centrifugal casting is a convenient way to produce cylindrical bimetallic castings. A ladle of metal is poured into a spinning mold. After a precise "delay time," a second ladle of metal is poured into the same mold.

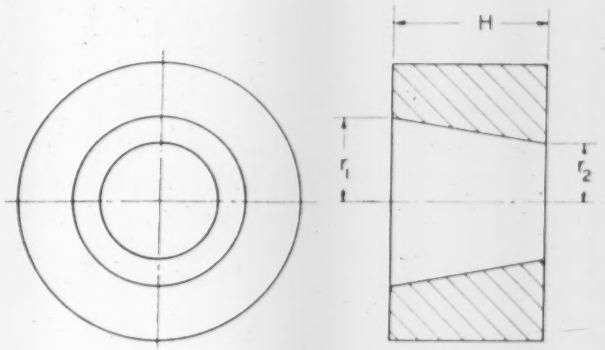
You can produce castings with a hard, wear-resistant metal on the outside diameter and a soft, easily machined metal on the inside, or vice versa.

Control — Casting bimetallic parts requires close control. Each pouring of metal must be accurately weighed. Adequate handling facilities must be available for pouring.

If delay time is excessive, the bonding of the first metal will be incomplete. If the delay time is too short, excessive "washing" may occur, causing the second metal to dilute the first, and vice versa, and reduce the thickness of the first metal.

The chief limitation: The solidification temperature of the second metal should be the same or lower than that of the first. Steel can not be poured after bronze, but bronze can be poured after steel.

You can produce castings with a taper on the inside diameter in a vertical centrifugal casting machine by controlling the speed of rotation. Here is the formula:



$$N = 264 \sqrt{\frac{H}{r_1^2 - r_2^2}}$$

N = rpm

r_1 = inside radius at top of bushing in inches

r_2 = inside radius at bottom of bushing in inches

H = height of bushing in inches

Rockwell Tester Inspects 1000 Pieces an Hour

The Console Model Size 3 is an automatic hardness tester which classifies tested pieces into three categories—good, too hard, and too soft.

The unit will test any metal on the regular Rockwell scales, such as A, B, C, D, E, F, G, H and K. Hardness limits may be as close as two Rockwell numbers.

Workpieces may be tested two ways: 1. Manual feeding and disposal. 2. Manual loading and automatic disposal and hardness classification. The unit has a safety stop for pieces which are not fed properly.

A simple change of plunger extensions makes it possible for the unit to test materials that vary 0.030 to 6 in. in thickness.

As each piece is tested, one of three lights on the tester will indicate the hardness classification—red for too hard, green for correct hardness and yellow for too soft.

The automatic counter for the three classifications can be mounted on the desk permanently, or it can be located any distance from the tester.

Single tests can be made by snapping a switch which changes the cycle from continuous to single

operation—the unit is then controlled by a push-button or a foot switch which is located under the table. *Write*: Wilson Mechanical Instrument Division, American Chain & Cable Co. Inc., 929 Connecticut Ave., Bridgeport 2, Conn. *Phone*: Edison 5-0161

Bar Automatic Makes Complete Cycle in 0.7 Second

The 7/16-in. RA-6 is a multiple spindle bar automatic that has an idle time of 0.466 second which is provided by the high speed segment of its drumshaft.

Special tooling applications include second operation attachments for threading, reaming, pickup and back burring, milling and crossdrilling.

Standard models provide spindle speeds up to 4500 rpm. Those equipped with a spindle stopping mechanism can hit 3200 rpm.

Although the spindle capacity is 7/16-in. with standard collet and pusher tubes, it can accommodate ½-in. round or 7/16-in. hexagonal stock when combined pushers and pusher tubes are used.

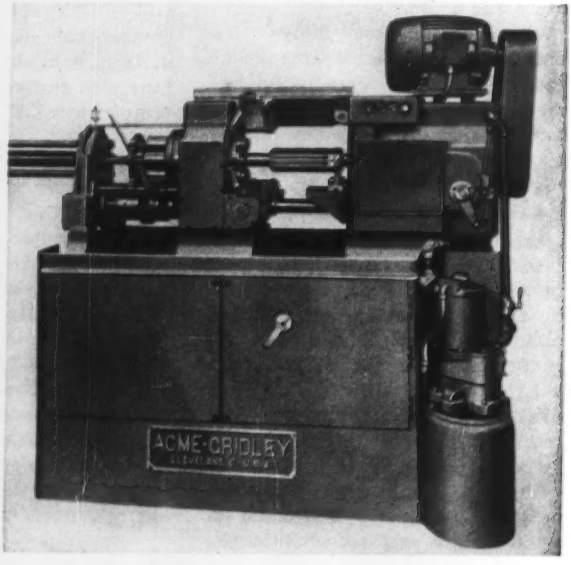
The tool slide is of standard Acme-Gridley flat surface design with a center keyway and parallel T-slots for holding down hinge-type toolholders. Standard end-working tools and special toolholders for operations requiring recessing attachments can be used.

The lower cross slides are of the flat type and are hardened and ground. They are about 4 x 6 in. The cross slides are mounted in slide ways with removable hardened and ground strips and caps.

The upper top slides also are hardened and ground and mounted in hardened and ground bases.

Arrangement has been made for independently operated auxiliary side slides in both the second and fifth positions.

The fifth position slide is usually used for cutoff;



but if a pickup attachment and back finishing slide are used, the cutoff can be mounted on top of a double-deck toolholder in the sixth position. *Write*: National Acme Co., 170 E. 131st St., Cleveland 8, O. *Phone*: Glenville 1-9080

NEW PRODUCTS and equipment

Pyrometer Controller

This multipoint unit automatically controls the temperature of four to ten separate units. It combines the accuracy of a null balance potentiometer measuring circuit with the speed of an electronic control system.

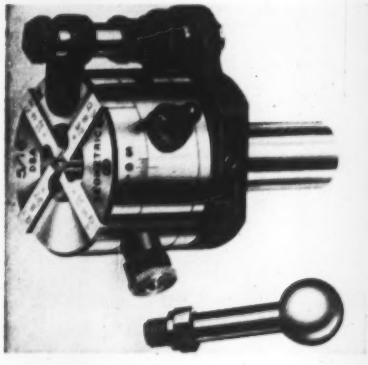
Operation: A pulse timer and selector switch automatically connect thermocouples in sequence to the master control unit which compares each thermocouple voltage to its set point and changes the corresponding load to the process unit.

Temperature ranges between −400 and +3250°F are available. *Write*: Thermo Electric Co. Inc., Saddle Brook, N. J. *Phone*: Hubbard 9-5800

Die Head

The DSA is a convertible self-opening die head with an aligning shank. It's for use on small screw machines—the automatic or hand type.

The die head is equipped with an outside trip for short length, fine pitch shoulder threading and a pull-off trip for longer threads which provide ample chaser engagement for tripping.



Conversion from one trip to the other is quick and simple. *Write*: Geometric Tool Co. Division, Greenfield Tap & Die Corp., New Haven 15, Conn. *Phone*: Fulton 7-2525

Clinch Nuts

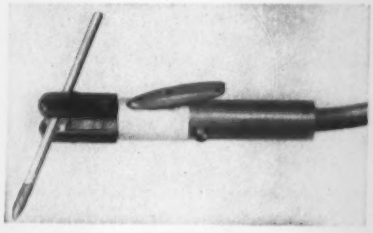
Nuts using the self-locking principle are available in sizes down to No. 0. They are made in a wide range of ferrous and nonferrous metals.

The nuts cannot shake loose under severe vibrations and may be used in temperatures of −70 to above 250°F. *Write*: Nylok Corp., 611 Industrial Ave., Paramus, N. J.

Cutting Torch

The H-3 uses an electric arc and compressed air to cut, gouge, groove and bevel all metals quickly and cleanly.

The pushbutton air valve is insulated and doesn't need to be held down. A glass laminate sleeve protects the handle. The cable connection is inside the handle which moves cable flexure away from the connection and increases cable life. *Write*: Arcair Co., 419 S. Mt. Pleasant St., Lancaster, O. *Phone*: Olive 3-5618



Spot Welding

All models of the semiautomatic Fillerarc wire drive can use the spot and tack welding accessory. It has locating plates for butt, corner and fillet welds.

Controls are mounted permanently on a steel door that replaces the standard door on the wire drive unit.

Operation: The gun is placed in position, and the trigger is pulled. This starts the electrode wire feed and gas. As soon as the wire touches the work, the arc is struck and a timer is tripped. Welding is stopped after the preset time delay. *Write*: Welding Department, General Electric Co., Schenectady 5, N. Y. *Phone*: Franklin 4-2211

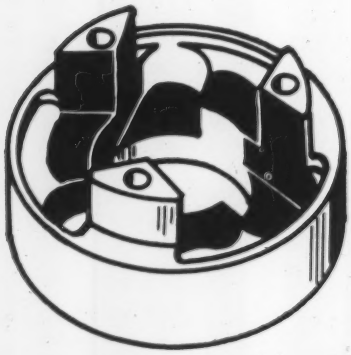
Material Handling Bucket

SCL is a wide model that comes in capacities of ¾ to 3 cu yd. The closing line goes through the center plane of the bucket to the first lower sheave. Large three-sectional bronze bushed rollers in the head further reduce cable and roller wear.

A large load at each grab is assured by hinges which increase the open width of the bucket and a flattened bowl which minimizes crowding. *Write*: Owen Bucket Co., 6001 Breakwater, Cleveland, O. *Phone*: Olympic 1-0333

CUSTOMER SPECIFIED

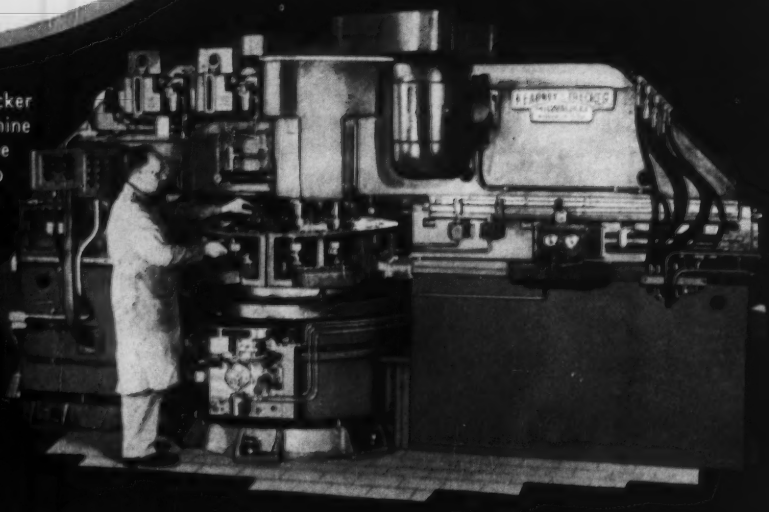
An automotive manufacturer recently asked Kearney & Trecker to design and build a special machine which would increase production milling of three pads and three pockets on transmission rear brake drums.



Black indicates machined pads and pockets on transmission brake drum.

KEARNEY & TRECKER DESIGNED

Here is our design. It's a Kearney & Trecker six-station rotary indexing milling machine which mills 162 transmission rear brake drums per hour. It does the work of two machines, each of which could mill only one workpiece at one time. With the new unit, six pieces are milled at once. A prominent feature of this machine was the application of standard Kearney & Trecker units . . . a 48" rotary index table and a 24" feed slide. This type of design appreciably decreases the overall cost of the machine. All six spindles are contained in one head which is bridged over the table. Retractable quills raise and lower the spindles.



New production efficiency starts with Kearney & Trecker Milwaukee machine tools

This typical example proves you can reduce costs and start on the road to higher production with machines designed and built by Kearney & Trecker's Special Machinery Division. With more than 50 years' experience in machine design and manufacture, Kearney & Trecker has all the ingenuity and skill required to solve special machining and production problems.

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For more details on the machine illustrated ask for Data Sheet No. 1044. The free booklet "Doorway to a proven method for solution of big and small metalworking problems" is also yours for the asking.

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NEW Literature

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Arc Furnaces

Transformers, switchgear, controls and direct current motors for use with arc furnaces are described in bulletin GEA-6351, 16 pages. General Electric Co., Schenectady 5, N. Y.

Aluminum Electrode

Advantages of an aluminum electrode with an extruded coating are presented in bulletin TIS 2891. Eutectic Welding Alloys Corp., 40-40 172nd St., Flushing 58, N. Y.

Salamander

This 4-page bulletin describes a gas-fired salamander for localized heating in industrial plants with high ceilings. Summit Products Co., Uniontown, Pa.

Brass Ingots

A new process for producing brass and bronze ingots with rigidly controlled properties is described in a bulletin. I. Schumann & Co., 4391 Bradley Rd., Cleveland 9, O.

Overhead Conveyor

Catalog M4, 150 pages, gives complete data on an overhead conveying system. Mechanical Handling Systems Inc., 4600 Nancy Ave., Detroit 12, Mich.

Aluminized Fence

This 4-page bulletin, DH-16, describes a steel wire fence which has a protective aluminum coating. Page Steel & Wire Division, American Chain & Cable Co. Inc., Monessen, Pa.

Throwaway Tooling

Bulletins 896-1 and 896-2 describe 30 and 45 degree chamfering tools which also can be used for other operations and gang setups. Wesson Co., 1220 Woodward Heights Blvd., Ferndale 20, Mich.

Spring Design

Fundamentals of spring design—basic stress and deflection formulas, materials, uses and limitations of various types of springs—are presented in an 8-page bulletin. Associated Spring Corp., Bristol, Conn.

Induction Melting

Bulletin 70, 8 pages, describes a line of furnaces and related equipment. Inductotherm Corp., 412 Illinois Ave., Delanco, N. J.

Forming Machines

Bulletin AHS-956, 4 pages, describes radial draw formers which produce automotive parts. Cyril Bath Co., 32290 Aurora Rd., Solon, O.

Rolling Mills

Catalog R, 36 pages, presents a line of rolling mills and auxiliary equipment for ferrous and nonferrous metals. Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

Die-Casting Machine

This 4-page bulletin describes a die-casting machine with 600 tons of locking pressure. Cleveland Automatic Machine Co., Cincinnati 12, O.

Welding Cable

Advantages of aluminum welding cable are given in bulletin TL-201, 4 pages. Tweco Products Inc., P. O. Box 666, Wichita 1, Kans.

Water Softeners

Bulletin 4520, 20 pages, explains the fundamentals of softening and selection of equipment and zeolites. Cochrane Corp., 17th St. below Allegheny, Philadelphia 32, Pa.

Cutoff Saws

This 44-page book describes abrasive cutting machines of the swing, chop and rotating types. Wallace Supplies Mfg. Co., 1300 Diversey Parkway, Chicago 14, Ill.

Corrosion Resistance

Pipes and fittings, valves, fume ducts and systems, tanks, towers, heat exchangers, agitators and pressure and vacuum equipment made of corrosion-resistant plastic are detailed in a 32-page bulletin, C-14. Haveg Industries Inc., 900 Greenbank Rd., Wilmington 8, Del.

Cold Galvanizing

This 4-page bulletin describes a compound for rustproofing iron and steel surfaces. It's applied by brush or spray and will withstand the 1000-hour salt spray test. American Solder & Flux Co., 19th & Willard St., Philadelphia 40, Pa.

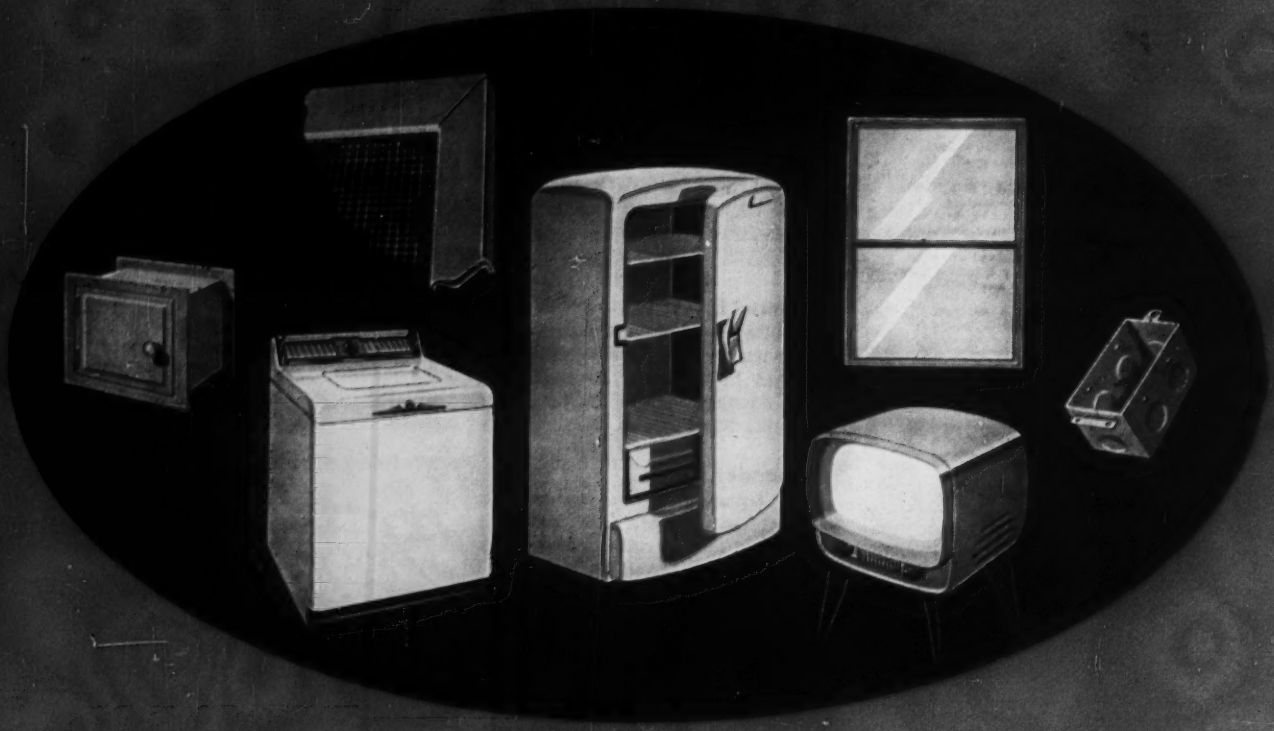
Plating

Bulletin 856, 8 pages, describes automatic machines for plating and processing. Meaker Co., 1629 S. 55th Ave., Chicago 50, Ill.

Automatic Lathe

Bulletin 1808, 24 pages, covers a lathe which has an automatic cycle for every basic turning requirement. Monarch Machine Tool Co., Sidney, O.

in the long run, galvanized steel...



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STEEL

December 24, 1956

Market Outlook

UPWARD PRESSURE on steel prices persists. It will spell increased costs to steel users.

The pressure stems from several directions: Rising freight rates, rising costs of steelmaking materials, rising costs of steelmaking labor—to say nothing about steel industry needs for money to pay climbing costs of plant replacement and expansion.

THE TREND—Although there are isolated instances where steel prices are being pared to meet competitive conditions, most of the changes are coming in the form of upward revisions in price extras. So far they are scattered, but they are there.

Even if there were no price increases, steel will cost the user more. He pays the costs of freighting steel to his plant. And the Interstate Commerce Commission authorized railroads to boost freight rates again—eastern lines, 7 per cent, western roads, 5 per cent. The request of southern railroads for a 7 per cent increase is scheduled for hearing Jan. 7.

RISING COSTS—Steelmaking materials have been going up. The year is closing with scrap about 26 per cent higher than it was at the start and 42 per cent above the low mark of the year. Another steelmaking material—manganese, silicon and nickel-bearing ferroalloys—just went up an average of 5.6 per cent.

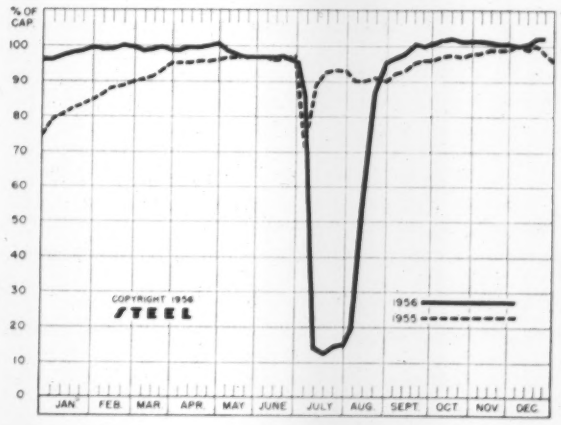
WAGES TO GO UP—Steelworkers' wages almost certainly will go up again. The steelworkers' new labor contract calls for cost-of-living increases based upon the Nov. 15 and May 15 consumer price index of the U.S. Bureau of Labor Statistics. The Nov. 15 index is due for announcement. The Oct. 15 index was high enough to give a 3-cent-an-hour increase, and its unlikely the Nov. 15 index will be lower.

PRICES—Price changes currently being made affect sheets and strip. Price extras on hot-rolled sheet steel are rising around $3.50 a ton and on cold-rolled sheet about $4 a ton. The base price of some high-carbon strip steel is being cut $12 a ton for competitive reasons.

IMPORTS HURT—Steel prices in Britain have just risen 6 per cent to cover increased transportation, coal and wage costs. Foreign steel, particularly wire products, is harassing wire producers in the Atlantic and Gulf coast states. This imported material is selling $25 to $40 a ton under our domestic prices.

WORLD STEEL—Although foreign countries do not have all the forms of steel they need, they do have plenty of some, and they are exporting it to the U.S. Every foreign country produced more steel this year than last. The only country with a decrease is the U.S., which suffered a midsummer steel strike. World production of steel for ingots and castings totaled 310,048,000 net tons in 1956, a 4.7 per cent increase over 1955's 296,107,695 tons. The U.S. is producing around 115 million tons this year. Steel outturn of the Free World this year is 232,845,000 tons, compared with 226,448,235 last year. Russia's production this year is 53.7 million tons, compared with last year's 49,789,300. The Iron Curtain total this year is 75,390,000 tons. Last year it was 68,033,460. Other countries accounted for 1,813,000 tons this year, compared with 1,626,000 last year.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Dec. 23	Change	Same Week 1955	Same Week 1954
Pittsburgh	102	— 0.5*	99	68
Chicago	105.5	+ 1.5*	98.5	82.5
Mid-Atlantic	102	0	98	67
Youngstown	104	0	95	70
Wheeling	100	0	98	62.5
Cleveland	104.5	0*	93.5	91.5
Buffalo	107.5	0	100	100
Birmingham	94	0	94.5	67
New England	74	+ 4	92	70
Cincinnati	90.5	— 3	92.5	72
St. Louis	90.5	— 5	100	62.5
Detroit	99	— 4.5	95	75.5
Western	102	— 1	108	88
National Rate	102	0	98	74.5

INGOT PRODUCTION‡

	Week Ended Dec. 23	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	156.3†	157	153.3	145.5
NET TONS (In thousands)	2,511†	2,522	2,463	2,338

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,461,893 in 1956; 2,413,278 in 1955; 2,384,549 in 1954.

Metalworking Outlook—p. 27 Technical Outlook—p. 63

Columbia Malleable Plant, Grinnell Corp.

Malleable To Rebound

Production should go over 1-million-ton mark next year if the auto industry makes a comeback. Many foundries not dependent upon motordom boosted sales this year

SHIPMENTS of malleable foundries this year are about 15 per cent off last year's pace. This exception to an otherwise good metalworking year is easy to explain: Nearly 40 per cent of this industry's output goes into the production of passenger cars.

Other Factors—The production decline this year would have been more severe if truck production had fallen. A sizable number of malleable castings go into the making of commercial vehicles.

Many foundries not dependent on the auto industry have been able to boost their sales this year. Increases of 10 to 15 per cent over 1955 are not unusual.

What's Ahead — Prospects for 1957 are good, says the National Malleable & Steel Castings Co., Cleveland. Any increase in auto production during 1957 will automatically mean more business. Lowell D. Ryan, executive vice president of the Malleable Founders' Society, Cleveland, says if business clicks next year as expected, production should hit 1 million to 1,050,000 tons. A big automotive year, he believes, could push production up to 1955's record breaking 1.1 million tons.

No. 1 Problem — A Chicago foundryman says high scrap prices have murdered malleable founders. Other comments:

R. L. Gilmore, president, Superior Steel & Malleable Castings Co., Benton Harbor, Mich.: "The constantly increasing price of scrap has made it extremely difficult for us to increase the price of malleable castings sufficiently to maintain a satisfactory profit margin."

George T. Boli, president, Northern Malleable Iron Co., St. Paul: "The rise in scrap prices has severely affected our cost picture. The total cost of raw materials and supplies for the first ten months of 1956, compared with that of the same period of 1955, shows an increase of 19.5 per cent, mainly due to the increased cost of pig iron and scrap."

R. N. Cole, president, Canton Malleable Iron Co., Canton, O., says you can readily see what happens to costs when certain grades of scrap you must use are 70 per cent higher than they were a year ago. He continues: "We have always strongly objected to the export of scrap, and it is strange that the administration will not limit this to an extent that it would not place such a hardship on industry in this country."

Mr. Ryan terms scrap prices "serious." He believes there should be a limit on scrap exports because: "It is in the national interest to keep scrap inside the U.S. where it is available in emergencies."

Prices—A spot survey indicates increases were general at the start of fall. Most foundries boosted their prices about 7 to 10 per cent then, although some held increases to about 5 per cent because they had upped prices about that much earlier in the year.

Future hikes are indicated. C. L. Liebau, president of the Federal Malleable Co., Milwaukee, says: "We are sure that there will be a price increase next year and possibly early in the year. Costs have already increased considerably over our Aug. 15 increase."

Mr. Gilmore of Superior Steel & Malleable states: "We do not be-

lieve that further price increases will be good for our industry—but we are definitely faced with such a price increase, probably during January."

The Comers — Shell cores and shell molding are receiving increasing attention from foundrymen in their drive to make better castings.

Another jump seems in prospect for pearlitic malleable. It has accounted for about 14 per cent of the malleable business since 1954. C. H. Ker, president, Dalton Foundries Inc., Warsaw, Ind., says the market is expanding rapidly. "Although the large expansion has been in automotive applications," he continues, "there are many uses being found outside the auto industry, and the demand is increasing."

Mr. Boli of Northern Malleable says about 25 per cent of his company's output is pearlitic. A considerable portion of this is used by the agricultural equipment industry. Mr. Cole of Canton Malleable says his company makes less pearlitic malleable for motordom than it does for other industries.

Cal C. Chambers, president, Texas Foundries Inc., Lufkin, Tex., lists these uses for pearlitic: Agricultural equipment, well tools, prestressed concrete, mechanical water gland fasteners, valves, building forms and ice scoring machinery.

Steel Bars . . .

Bar Prices, Page 86

Demand for carbon bars continues in good volume, but some seasonal slackening over the holidays is likely.

Mill allotments for January and February have been absorbed, and the mills are showing no particular concern for March. Inquiry for large rounds and flats continues strong. Even the small sizes are moving fairly well. Producers anticipate full first quarter bookings.

The warehouses have been able to build up fairly rounded stocks of all sizes, except the larger specifications.

Cold-finished bars appear to be moving at a slightly more active pace, but there still is room for improvement. The slow, but steady, pickup in auto requirements, is having some effect — not only in cold-finished carbon, but in hot and cold-rolled alloy bars as well.

Generally, converters are not under great pressure from their customers. They anticipate better demand after the turn of the year. Encouraging them is the slight improvement in automotive requirements.

Bolt and nut manufacturers are taking their allotments, but except for the larger sizes, they are not pressing mills for shipments. Their business continues strong in structural fasteners, but is disappointing in manufacturing assembly items. (This sluggishness is due chiefly to the lag in automotive specifications.)

Sheets, Strip . . .

Sheet & Strip Prices, Pages 87 & 88

The outlook for first quarter cold-rolled sheet demand continues uncertain. Production difficulties in the auto industry are clearing up, but there is still a question whether the auto builders will consume as much tonnage as the mills anticipated when they set up first quarter quotas.

Certainly, the auto shops have specified far less tonnage for January than had been contemplated. Mills have had to push tonnage hard in other directions to fill in the gaps in their schedules.

Supplies of hot-rolled sheets are not quite as tight as they were reported recently, but they are still in a squeeze. All producers claim they could book much more tonnage.

The lag in cold-rolled sheets has, in spots, helped out the supply of hot-rolled, but, in general, not to any marked extent. Nor is it likely to. Most sellers still are confident that cold-rolled requirements will absorb allotments before the end of the first quarter. There is general agreement in the trade that much depends on new automobile sales. Initial movement of the new models has been encouraging, but a real test is not anticipated until spring.

Cold-rolled sheet and strip bookings for the first quarter are slightly heavier in New England, although there is no substantial buying beyond February. Most users can place orders for shipment that month. Makers of auto parts continue to hold off their heavy releases. Several producers that have been out of the New England market for carbon sheets several years are actively soliciting business in the area, offering tonnage and equalizing prices with the nearest production point.

American Steel & Wire Division, U.S. Steel Corp., last week revised downward prices on cold-finished spring steel in the 0.61-0.80 carbon type. It now quotes 12 cents at Cleveland, and 12.30 cents at Worcester, against 12.60 and 12.90 formerly. Acme Steel Co. made a similar reduction at Riverdale, Ill.

U.S. Steel Corp. last week announced increases in extras on carbon and low-alloy high-strength sheets. They involved increases of 5 to 30 cents per 100 lb, in gages and width extras, and increases of 5 to 20 cents in certain quality and chemical extras. The new extras became effective Dec. 19.

Other producers are following the lead of Armco Steel Corp. in revising extras upward last week on hot and cold-rolled sheets. The changes amount to increases of about 3 per cent. Among those making the revision are Jones & Laughlin Steel Corp., National Steel Corp. and Sharon Steel Corp.

Tin Plate . . .

Tin Plate Prices, Page 88

Tin plate inquiry continues active, particularly for electrolytic plate. Canners are forcing mill production to the limit.

In part, the pressure is traced to labor disturbances earlier in the year, particularly at the plant of the Tennessee Coal & Iron Division, U. S. Steel Corp. Tin plate consumers have not been able to build up their inventories.

Stainless Steel . . .

Stainless Steel Prices, Page 92

Other producers are expected to follow the recent action of the Allegheny Ludlum Steel Corp., Pittsburgh, advancing base prices on certain nickel-bearing stainless steel grades to reflect increases in the cost of nickel and other raw materials.

The increases by Allegheny, effective Dec. 12, on the most commonly used grades are: Type 201, up 1.75 cents a pound; 301, up

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2.00 cents; 302, up 2.50 cents; 304, up 3.00 cents; 309, up 4.00 cents; 3.10, up 6.00 cents.

Crucible Steel Co. of America last week increased prices on nickel-bearing stainless steel, effective Dec. 18. Increases on some popular grades varied from 1.75 cents to 3.50 cents a pound.

Plates . . .

Plate Prices, Page 86

The seasonal slackening in construction activity has brought no easing in pressure for deliveries from the plate mills. Actually, with the tanker program before the market, there is little prospect for any substantial easing in supply conditions for many months.

American Pipe & Construction Co., Portland, Oreg., has a contract for tanks and digesters for a pulp mill at Toledo, Oreg., for the Georgia-Pacific Corp. Plate tonnage required is unstated.

This fabricator reports various other awards, but the stringency in plate supplies is a serious handicap in booking new business.

In the Pacific Northwest, Seattle and Portland are asking bids on steel water tanks. Major oil companies are reported planning 1957 expansions that will require large plate tonnage.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 86

Strong demand for reinforcing bars is continuing, and expectations are there will be no material change in market conditions over coming months. Supplies are likely to tighten as more building work is diverted to concrete construction because of the shortage of structural steel.

Northwest Rolling Mills Inc., Seattle, suspended operations for two weeks beginning Dec. 21 to permit overhaul and repairs. The electric furnace will continue in operation.

Two major public works jobs in the area, involving 26,000 tons of bars, are up for bids late this month: Ice Harbor project, Washington state, 17,500 tons, Dec. 18, and Trinity dam, northern California, 9000 tons, Dec. 20. New bids will be taken in January for foundations for the second power plant at Ft. Peck, Mont.

Wire . . .

Wire Prices, Pages 88 & 91

Slack demand for wire is easing carbon rod supply. More semifinished tonnage is offered, and buying is increasingly selective. On some grades of finished carbon wire, January schedules are not filled though normal lead time has expired. Demand for heading grades and spring wire is spotty. Automotive buying still lags. Most alloy specialties are moving slowly, and stainless wire can be had for February shipment.

Price revisions were effected on one grade of cold-finished spring steel last week by American Steel & Wire Division, U.S. Steel Corp. Downward adjustments lowered the 0.61 to 0.80 carbon type from 12.60 to 12 cents at Cleveland, and from 12.90 to 12.30 cents at Worcester. The reductions reflect competition.

Tubular Goods . . .

Tubular Goods Prices, Page 92

Union Steel Corp., Union, N. J., has begun a $9-million plant expansion at New Market, N. J., to manufacture welded stainless steel pipe and tubing. The program, says Russell Cooper, vice president, will ultimately provide eight acres of manufacturing facilities in four buildings.

The first building, having 160,000 sq ft of floor space, is expected to be completed in the latter part of 1957.

Earlier this year, the company doubled its manufacturing facilities at Union.

The company produces stainless steel tubing from ¼ to 5 in. OD, with wall thickness of 0.010 to 0.154 in.

The cast iron pipe market in the Pacific Northwest is dormant, but new interest is expected to develop shortly.

Structural Shapes . . .

Structural Shape Prices, Page 86

Early action is expected in the awarding of several large office and bridge structures in the New York area. Latest outstanding awards in the district include 4600 tons for a municipal court house in lower Manhattan, and 3000 tons for a section of the Brooklyn-Queens connecting highway.

Structural delivery promises still run well more than a year, with the medium and large size shops. Promises of one eastern fabricator run beyond two years. The smaller shops are quoting around six to seven months.

At least ten or more fair size bridge projects are pending for the states of Pennsylvania and New Jersey. Two projects in Allegheny county, Pa., requiring 12,200 tons, are expected to be placed momentarily.

A report in the Buffalo area last week: An eastern New York contractor erecting a large school received his structural steel several months earlier than he had counted on. This was seen as possibly pointing to some improvement in structural steel deliveries due to the seasonal slow down of building. In general, mills report both plates and structurals are in as tight supply as ever.

Some Seattle area fabricators are not actively bidding on new work unless they are assured steel supplies. The larger shops in the district have comfortable backlogs and are selective in seeking new business. In the Los Angeles market, fabricators are studying the highway building program in the Pacific Northwest to see to what extent they can participate. This study stems from belief highway construction jobs approved for California may be delayed.

Pacific Coast mills report a strong demand for all types of steel piling. Imported wide flange beams from Europe are snapped up by buyers as quickly as they arrive.

Heavy tonnage for power transmission towers is expected early next year. Two Missouri Basin projects, 225 miles, will require 2500 tons, bids closing at Denver next month.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4600 tons, municipal court house, Center and White streets, New York, to Lehigh Structural Steel Co., Allentown, Pa.

3000 tons, section, Brooklyn-Queens connecting highway, New York, through Brookfield Construction Co., general contractor, to Harris Structural Steel Co., New York.

305 tons, YWCA building, Portland, Oreg., to Bethlehem Pacific Coast Steel Corp., Seattle; A. V. Peterson, Portland, general contractor.

STRUCTURAL STEEL PENDING

965 tons, state bridge work, Montgomery county, Pa.; bids Jan. 4.

764 tons, state bridge work, Borough of Glen Rock, Bergen county, N. J.; Jan. 3; also 367 tons of reinforcing steel.

650 tons, state bridge work, York county Pa.; bids Jan. 4.

600 tons, addition to light department building, Seattle; bids Jan. 16.

400 tons, Seattle Light Department service facility, $1.275 million project; plans approved, bids in January.

587 tons, state bridge work, Lawrence county Pa.; bids Jan. 4.

416 tons, state bridge work, Lehigh county Pa.; bids Jan. 4.

295 tons, state bridge work, York county, Pa.; bids Jan. 4.

232 tons, state bridge work, Gloucester township, Camden county, N. J.; bids Jan. 3; also 127 tons of reinforcing bars.

100 tons or more, Adak Naval Station, Alaska; bids to U.S. Engineer, Seattle, Jan. 22.

100 tons or more, 85-ton gantry crane, Ice Harbor project; American Ligurian Co., New York, agents for German fabricator, apparently low at $316,155 to U.S. Engineer, Walla Walla, Wash.

REINFORCING BARS . . .

REINFORCING BARS PENDING

600 tons, foundations for second power plant, Ft. Peck, Wash.; October bids rejected; new bids planned in January.

500 tons, proposed ammunition storage depots, Elmendorf and Ladd air bases, Alaska; indefinitely postponed by U.S. Engineer.

100 tons or more, seven-story addition to Columbus Hospital, Seattle; bids Jan. 7.

190 tons or more, Lake City treatment plant, Seattle; G. R. Leischner Construction Co., low at $621,490.

100 tons or more, YWCA building, Yakima, Wash.; G. H. Moen, Yakima, is low on base bid of $1,251,671.

PLATES . . .

PLATES PLACED

Unstated, tanks and other equipment, Georgia-Pacific pulp mills, Toledo, Oreg., to the American Pipe & Construction Co., Portland, Oreg.

PLATES PENDING

Unstated, 2-million-gal water tank; bids to Seattle soon; steel or prestressed concrete.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Virginia Railways, six 2400-horsepower Diesel-electric road-switching units, to Fairbanks-Morse & Co., Chicago.

LOCOMOTIVES PENDING

Illinois Central, four diesel-electric passenger locomotives, purchase contemplated.

RAILROAD CARS PLACED

Boston & Maine, three rail diesel cars, to the Budd Co., Philadelphia.

Great Northern, 2200 tons tie plates; also track spikes, to the Bethlehem Pacific Coast Steel Corp., Seattle.

Northern Pacific, fifty 19,000-gal tank cars, to ACF Industries Inc.

Tennessee Central, ten 70-ton covered hopper cars, to Greenville Steel Car Co., Greenville, Pa.

Virginian Railway, five hundred 70-ton hopper cars, to own Princeton, W. Va., shops.

Conemaugh & Black Lick, twenty-five 70-ton gondola cars, to Bethlehem Steel Co., Bethlehem, Pa.

Norfolk & Western, ten air dump cars, to Baldwin-Lima-Hamilton Corp., Eddystone, Pa.

Illinois Central, 2000 boxcars, to own shops at Centralia, Ill.; company also contemplates adding 110 flatcars and 50 steel caboose cars.

Toronto, Hamilton & Buffalo, fifty 70-ton gondola cars and ten 70-ton covered hopper cars, to National Steel Car Corp., Hamilton, Ont.

RAILROAD CARS PENDING

State Railways of Thailand, Bangkok, six rail diesel cars and 12 trailers; bids asked.

CLYDE E. WEED

Portrait by Fabian Bachrach

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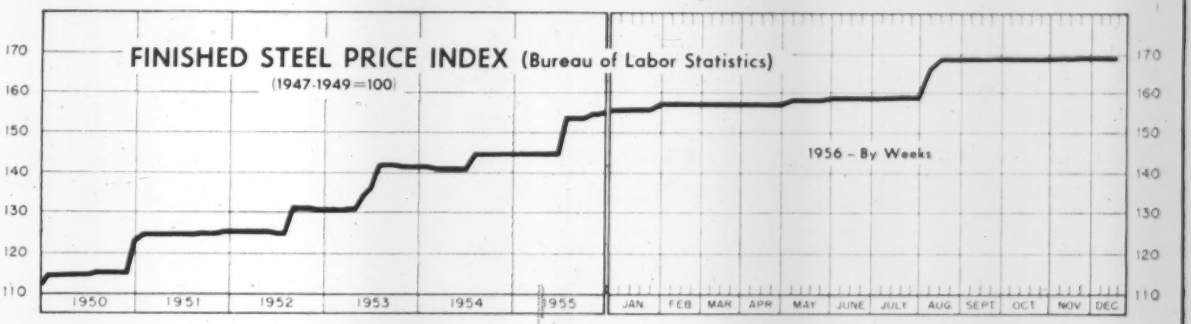
STEEL
The Metalworking Weekly

Price Indexes and Composites



Dec. 18, 1956	Week Ago	Month Ago	Dec. Avg.	Year Ago
169.2	**168.8**	**168.8**	**168.8**	**155.3**

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Dec. 18

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard, No. 1	$5.150	Bars, Reinforcing	5.738
Rails, Light, 40 lb	6.567	Bars, C.F., Carbon	9.610
Tie Plates	6.025	Bars, C.F., Alloy	13.275
Axles, Railway	9.017	Bars, C.F., Stainless, 302 (lb)	0.520
Wheels, Freight Car, 33 in. (per wheel)	57.50	Sheets, H.R., Carbon	5.765
Plates, Carbon	5.550	Sheets, C.R., Carbon	6.682
Structural Shapes	5.267	Sheets, Galvanized	8.220
Bars, Tool Steel, Carbon (lb)	0.480	Sheets, C.R., Stainless, 302 (lb)	0.643
Bars, Tool Steel Alloy, Oil Hardening Die (lb)	0.585	Sheets, Electrical	11.225
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.274	Strip, C.R., Carbon	8.843
Bars, Tool Steel H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.769	Strip, C.R., Stainless, 403 (lb)	0.475
Bars, H.R., Alloy	10.025	Strip, H.R., Carbon	5.900
Bars, H.R., Stainless, 303 (lb)	0.495	Pipe, Black, Buttweld (100 ft)	18.376
Bars, H.R., Carbon	5.925	Pipe, Galv., Buttweld (100 ft)	22.516
		Pipe, Line (100 ft)	182.860
		Casing, Oil Well, Carbon (100 ft)	178.046
		Casing, Oil Well, Alloy (100 ft)	276.870
		Tubes, Boiler (100 ft)	45.033
		Tubing, Mechanical, Carbon (100 ft)	22.973
		Tubing, Mechanical, Stainless, 304 (100 ft)	187.133
		Tin Plate, Hot-dipped, 1.25 lb	9.433
		Tin Plate, Electrolytic, 0.25 lb	8.133
		Black Plate, Canmaking Quality	7.233
		Wire, Drawn, Carbon	9.175
		Wire, Drawn, Stainless, 430 (lb)	0.630
		Bale Ties (bundle)	7.213
		Nails, Wire, 8d Common	9.365
		Wire, Barbed (80-rod spool)	8.412
		Woven Wire Fence (20-rod roll)	20.505

STEEL's FINISHED STEEL PRICE INDEX*

	Dec. 19 1956	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	225.92	225.92	225.92	208.90	171.92
Index in cents per lb	6.111	6.111	6.111	5.659	4.657

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel NT*	$137.66	$137.66	$137.66	$127.95	$106.32
No. 2 Fdry Pig Iron, GT	62.63	62.63	62.63	58.99	52.54
Basic Pig Iron, GT	62.18	62.18	62.18	58.49	52.16
Malleable Pig Iron, GT	63.41	63.41	63.41	59.77	53.27
Steelmaking Scrap, GT	64.83	65.50	62.00	50.67	43.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Dec. 19 1956	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	5.075	5.075	5.075	4.65	3.70
Bars, H.R., Chicago	5.075	5.075	5.075	4.65	3.70
Bars, H.R., deld., Philadelphia	5.35	5.35	5.35	4.90	4.223
Bars, C.F., Pittsburgh	6.85*	6.85*	6.85*	5.90	4.55
Shapes, Std., Pittsburgh	5.00	5.00	5.00	4.60	3.65
Shapes, Std., Chicago	5.00	5.00	5.00	4.60	3.65
Shapes, deld., Philadelphia	5.40	5.40	5.40	4.88	3.918
Plates, Pittsburgh	4.85	4.85	4.85	4.50	3.70
Plates, Chicago	4.85	4.85	4.85	4.50	3.70
Plates, Coatesville, Pa.	5.25	5.25	5.25	4.80	4.15
Plates, Sparrows Point, Md.	4.85	4.85	4.85	4.50	3.70
Plates, Claymont, Del.	5.35	5.35	5.35	4.80	4.15
Sheets, H.R., Pittsburgh	4.675	4.675	4.675	4.325	3.60-3.75
Sheets, H.R., Chicago	4.675	4.675	4.675	4.325	3.60
Sheets, C.R., Pittsburgh	5.75	5.75	5.75	5.325	4.35
Sheets, C.R., Chicago	5.75	5.75	5.75	5.325	4.35
Sheets, C.R., Detroit	5.75-5.85	5.75-5.85	5.75-5.85	5.325-5.425	4.55
Sheets, Galv., Pittsburgh	6.30	6.30	6.30	5.85	4.80
Strip, H.R., Pittsburgh	4.675	4.675	4.675	4.325	3.75-4.00
Strip, H.R., Chicago	4.675	4.675	4.675	4.325	3.50
Strip, C.R., Pittsburgh	6.85	6.85	6.85	6.25	4.65-5.35
Strip, C.R., Chicago	6.85	6.85	6.85	6.35	4.90
Strip, C.R., Detroit	6.95	6.95	6.95	6.35	4.85-5.60
Wire, Basic, Pittsburgh	7.20	7.20	7.20	6.25	4.85-5.10
Nails, Wire, Pittsburgh	8.20	8.20	8.20	7.60	5.90-6.20
Tin plate (1.50 lb), box, Pitts.	$9.95	$9.95	$9.95	$9.45	$8.70

*Including 0.35c for special quality

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$91.50	$91.50	$91.50	$84.50	$66.00
Wire rods, 7/32-9/32" Pitts.	5.80	5.80	5.80	5.025	4.10-4.30

PIG IRON, Gross Ton	Dec. 19 1956	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$63.50	$63.50	$63.50	$59.50	$53.00
Basic, Valley	62.50	62.50	62.50	58.50	52.00
Basic, deld. Phila.	66.26	66.26	66.26	62.16	56.61
No. 2 Fdry, NevilleIsland,Pa.	63.00	63.00	63.00	59.00	52.50
No. 2 Fdry, Chicago	63.00	63.00	63.00	59.00	52.50
No. 2 Fdry, deld. Phila.	66.76	66.76	66.76	62.66	57.11
No. 2 Fdry, Birm.	59.00	59.00	59.00	55.00	48.88
No. 2 Fdry (Birm.) deld. Cin.	66.70	66.70	66.70	62.70	55.49
Malleable, Valley	63.00	63.00	63.00	59.00	52.50
Malleable, Chicago	63.00	63.00	63.00	59.00	52.50
Ferromanganese, Duquesne	235.00†	235.00†	235.00†	190.00†	188.00††

†74-76% Mn, net ton. ††75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$66.50	$66.50	$62.50	$50.50	$44.00
No. 1 Heavy Melt, E. Pa.	63.00	63.00	59.00	52.00	42.50
No. 1 Heavy Melt, Chicago	65.00	67.00	64.50	49.50	42.50
No. 1 Heavy Melt, Valley	66.50	66.50	66.50	52.50	44.00
No. 1 Heavy Melt, Cleve.	65.00	65.00	65.00	51.50	43.00
No. 1 Heavy Melt, Buffalo	62.50	62.50	59.50	45.50	43.00
Rails, Rerolling, Chicago	89.50	93.50	87.50	71.00	52.50
No. 1 Cast, Chicago	50.50	50.50	50.50	50.50	49.00

COKE, Net Ton					
Beehive, Furn, Connlsvl.	$14.50	$14.50	$14.50	$14.125	$14.75
Beehive, Fdry, Connlsvl.	17.50	17.50	17.50	16.50	17.50

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers page 95; to footnotes, page 99.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 ..... $70.50

INGOTS, Alloy (NT)

Detroit R7 ..... $74.00
Houston 85 ..... 74.00
Midland,Pa. C18 ..... 74.00
Munhall,Pa. U5 ..... 74.00

BILLETS, BLOOMS & SLABS

Carbon, Rerolling (NT)

Aliquippa,Pa. J5 ..... $74.00
Bessemer,Pa. U5 ..... 74.00
Bridgeport,Conn. N19 .. 79.00
Buffalo R2 ..... 74.00
Clairton,Pa. U5 ..... 74.00
Ensley,Ala. T2 ..... 74.00
Fairfield,Ala. T2 ..... 74.00
Fontana,Calif. K1 ..... 83.50
Gary,Ind. U5 ..... 74.00
Johnstown,Pa. B2 ..... 74.00
Lackawanna,N.Y. B2 ..... 74.00
LoneStar,Tex. L6 ..... 80.00
Munhall,Pa. U5 ..... 74.00
Pittsburgh J5 ..... 74.00
S.Chicago,Ill. R2, U5 .. 74.00
S.Duquesne,Pa. U5 ..... 74.00
Sterling,Ill. N15 ..... 74.00
Youngstown R2 ..... 74.00

Carbon, Forging (NT)

Aliquippa,Pa. J5 ..... $91.50
Bessemer,Pa. U5 ..... 91.50
Bridgeport,Conn. N19 .. 96.50
Buffalo R2 ..... 91.50
Canton,O. R2 ..... 94.00
Clairton,Pa. U5 ..... 91.50
Conshohocken,Pa. A3 .. 96.50
Ensley,Ala. T2 ..... 91.50
Fairfield,Ala. T2 ..... 91.50
Fontana,Calif. K1 ..... 101.00
Gary,Ind. U5 ..... 91.50
Geneva,Utah C11 ..... 91.50
Houston 85 ..... 96.50
Johnstown, Pa. B2 ..... 91.50
Lackawanna,N.Y. B2 .. 91.50
LosAngeles B3 ..... 101.00
Midland,Pa. C18 ..... 91.50
Munhall,Pa. U5 ..... 91.50
Pittsburgh J5 ..... 91.50
Seattle B3 ..... 105.00
S.Chicago R2, U5, W14 91.50
S.Duquesne,Pa. U5 ..... 91.50
S.SanFrancisco B3 ..... 101.00

Alloy, Forging (NT)

Bethlehem,Pa. B2 ..... $107.00
Bridgeport,Conn. N19 107.00
Buffalo R2 ..... 107.00
Canton,O. R2 ..... 107.00
Conshohocken,Pa. A3 .. 114.00
Detroit R7 ..... 107.00
Fontana,Calif. K1 ..... 128.00
Gary,Ind. U5 ..... 107.00
Houston 85 ..... 112.00
Ind.Harbor,Ind. Y1 .. 107.00
Johnstown,Pa. B2 ..... 107.00
Lackawanna,N.Y. B2 .. 107.00
LosAngeles B3 ..... 127.00
Massillon,O. R2 ..... 107.00
Midland,Pa. C18 ..... 107.00
Munhall,Pa. U5 ..... 107.00
S.Chicago R2,U5,W14 107.00
S.Duquesne,Pa. U5 .. 107.00
Struthers,O. Y1 ..... 107.00
Warren,O. C17 ..... 107.00

ROUNDS, SEAMLESS TUBE (NT)

Bridgeport,Conn. N19 $116.50
Buffalo R2 ..... 111.50
Canton,O. R2 ..... 114.00
Cleveland,O. R2 ..... 111.50
Gary,Ind. U5 ..... 111.50
S.Chicago,Ill. R2,W14 111.50
S.Duquesne,Pa. U5 .. 111.50

SKELP

Aliquippa,Pa. J5 ..... 4.725
LoneStar,Tex. L6 ..... 5.025
Munhall,Pa. U5 ..... 4.625
SparrowsPoint,Md. B2 .. 4.625
Warren,O. R2 ..... 4.625
Youngstown R2, U5 .. 4.625

WIRE RODS

AlabamaCity,Ala. R2 .. 5.80
Aliquippa,Pa. J5 ..... 5.00
Alton,Ill. L1 ..... 6.00
Buffalo W12 ..... 5.80
Cleveland A7 ..... 5.80
Donora,Pa. A7 ..... 5.80
Fairfield,Ala. T2 ..... 5.80
Houston 85 ..... 6.05
IndianaHarbor,Ind. Y1 5.80
Johnstown,Pa. B2 ..... 5.80
Joliet,Ill. A7 ..... 5.80
KansasCity,Mo. 85 ..... 6.05
Kokomo,Ind. C16 ..... 5.90
LosAngeles B3 ..... 6.60
Minnequa,Colo. C10 .... 6.05
Monessen,Pa. P7 ..... 5.80
N.Tonawanda,N.Y. B11 .. 5.80
Pittsburg,Calif. C11 .... 6.45
Portsmouth,O. P12 ..... 5.80
Roebling,N.J. R5 ..... 5.90
S.Chicago,Ill. R2 ..... 5.80
SparrowsPoint,Md. B2 .. 5.90
Sterling,Ill.(1) N15 ..... 5.80
Sterling,Ill. N15 ..... 5.90
Struthers,O. Y1 ..... 5.80
Worcester,Mass. A7 ..... 6.10

STRUCTURALS

Carbon Steel Std. Shapes

Ala.City,Ala. R2 ..... 5.00
Aliquippa,Pa. J5 ..... 5.00
Bessemer,Ala. T2 ..... 5.00
Bethlehem,Pa. B2 ..... 5.05
Birmingham C15 ..... 5.30
Clairton,Pa. U5 ..... 5.00
Fairfield,Ala. T2 ..... 5.00
Fontana,Calif. K1 ..... 5.70
Gary,Ind. U5 ..... 5.00
Geneva,Utah C11 ..... 5.00
Houston 85 ..... 5.10
Ind.Harbor,Ind. I-2 ..... 5.00
Johnstown,Pa. B2 ..... 5.05
KansasCity,Mo. 85 ..... 5.10
Lackawanna,N.Y. B2 .. 5.05
LosAngeles B3 ..... 5.70
Minnequa,Colo. C10 .... 5.30
Munhall,Pa. U5 ..... 5.00
Niles,Calif. P1 ..... 5.75
Phoenixville,Pa. P4 .... 5.85
Portland,Oreg. O4 ..... 5.80
Seattle B3 ..... 5.75
S.Chicago,Ill. U5, W14 .. 5.00
S. SanFrancisco B3 .... 5.65
Sterling,Ill. N15 ..... 5.00
Torrance,Calif. C11 .... 5.70
Weirton,W.Va. W6 .... 5.00

Wide Flange

Bethlehem,Pa. B2 ..... 5.05
Clairton,Pa. U5 ..... 5.00
Fontana,Calif. K1 ..... 5.85
IndianaHarbor,Ind. I-2 .. 5.00
Lackawanna,N.Y. B2 .. 5.05
Munhall,Pa. U5 ..... 5.00
Phoenixville,Pa. P4 .... 5.85
S.Chicago,Ill. U5 ..... 5.00

Alloy Std. Shapes

Clairton,Pa. U5 ..... 6.20
Gary,Ind. U5 ..... 6.20
Houston 85 ..... 6.30
Munhall,Pa. U5 ..... 6.20
S.Chicago,Ill U5 ..... 6.20

H.S., L.A. Std. Shapes

Aliquippa,Pa. J5 ..... 7.35
Bessemer,Ala. T2 ..... 7.35
Bethlehem,Pa. B2 ..... 7.40
Clairton,Pa. U5 ..... 7.35
Fairfield,Ala. T2 ..... 7.35
Fontana,Calif. K1 ..... 8.05
Gary,Ind. U5 ..... 7.35
Geneva,Utah C11 ..... 7.35
Houston 85 ..... 7.45
Ind.Harbor,Ind. I-2,Y1 7.35
Johnstown,Pa. B2 ..... 7.40
KansasCity,Mo. 85 ..... 7.45
Lackawanna,N.Y. B2 .. 7.40
LosAngeles B3 ..... 8.05
Munhall,Pa. U5 ..... 7.35
Seattle B3 ..... 8.10
S.Chicago,Ill. U5, W14 .. 7.35
S.SanFrancisco B3 .... 8.00
Struthers,O. Y1 ..... 7.35

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 ..... 7.40
Ind.Harbor,Ind. I-2 ..... 7.35
Lackawanna,N.Y. B2 .. 7.40
Munhall,Pa. U5 ..... 7.35
S.Chicago,Ill. U5 ..... 7.35

PILING

BEARING PILES

Bethlehem,Pa. B2 ..... 5.05
Lackawanna,N.Y. B2 .. 5.05
Munhall,Pa. U5 ..... 5.00
S.Chicago,Ill. U5 ..... 5.00

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ..... 5.90
Lackawanna,N.Y. B2 .. 5.90
Munhall,Pa. U5 ..... 5.90
S.Chicago,Ill. U5 ..... 5.90

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 ..... 4.85
Aliquippa,Pa. J5 ..... 4.85
Ashland,Ky. (15) A10 .. 4.85
Bessemer,Ala. T2 ..... 4.85
Bridgeport,Conn. N19 .. 4.75
Clairton,Pa. U5 ..... 4.85
Claymont,Del. C22 ..... 5.35
Cleveland J5, R2 ..... 4.95
Coatesville,Pa. L7 ..... 5.25
Conshohocken,Pa. A3 .. 4.90
Detroit M1 ..... 4.95
Ecorse,Mich. G5 ..... 4.95
Fairfield,Ala. T2 ..... 4.85
Fontana,Calif.(30) K1 .. 5.55
Gary,Ind. U5 ..... 4.85
Geneva,Utah C11 ..... 4.85
GraniteCity,Ill. G4 .... 5.05
Harrisburg,Pa. P4 .... 5.80
Houston 85 ..... 4.95
Ind.Harbor,Ind. I-2, Y1 4.85
Johnstown,Pa. B2 ..... 4.85
Lackawanna,N.Y. B2 .. 4.85
LoneStar,Tex. L6 ..... 5.20
Minnequa,Colo. C10 .... 5.70
Munhall,Pa. U5 ..... 4.85
Newport,Ky. N9 ..... 4.85
Pittsburgh J5 ..... 4.85
Riverdale,Ill. A1 ..... 4.85
Seattle B3 ..... 5.75
Sharon,Pa. S3 ..... 4.85
S.Chicago,Ill. U5, W14 .. 4.85
SparrowsPoint,Md. B2 .. 4.85
Steubenville,O. W10 .... 4.85
Warren,O. R2 ..... 4.85
Weirton,W.Va. W6 .... 4.85
Youngstown R2, U5, Y1 4.85

PLATES, Carbon Abras. Resist.

Claymont,Del. C22 .... 6.20
Fontana,Calif. K1 ..... 6.70
Geneva, Utah C11 .... 6.00
Jonhstown,Pa. B2 ..... 5.65
SparrowsPoint,Md. B2 .. 5.65

PLATES, Wrought Iron

Economy,Pa. B14 .... 11.128

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5 ..... 7.25
Bessemer,Ala. T2 ..... 7.25
Clairton,Pa. U5 ..... 7.25
Claymont,Del. C22 ..... 7.55
Cleveland J5, R2 ..... 7.25
Coatesville,Pa. L7 ..... 7.55
Conshohocken,Pa. A3 .. 7.25
Ecorse,Mich. G5 ..... 7.35
Fairfield,Ala. T2 ..... 7.25
Fontana,Calif.(30) K1 .. 7.95
Gary,Ind. U5 ..... 7.25
Geneva,Utah C11 ..... 7.25
Houston 85 ..... 7.35
Ind.Harbor,Ind. I-2, Y1 7.25
Johnstown,Pa. B2 ..... 7.25
Munhall,Pa. U5 ..... 7.25
Pittsburgh J5 ..... 7.25
Seattle B3 ..... 8.15
Sharon,Pa. S3 ..... 7.25
S.Chicago,Ill. U5, W14 .. 7.25
SparrowsPoint,Md. B2 .. 7.25
Warren,O. R2 ..... 7.25
Youngstown U5, Y1 ..... 7.25

PLATES Alloy

Bridgeport,Conn. N19 .. 6.55
Claymont,Del. C22 ..... 6.85
Coatesville,Pa. L7 ..... 6.85
Fontana,Calif.(30) K1 .. 7.55
Gary,Ind. U5 ..... 6.85
Houston 85 ..... 6.95
Ind.Harbor,Ind. Y1 ..... 6.85
Johnstown,Pa. B2 ..... 6.85
Munnall,Pa. U5 ..... 6.85
Newport,Ky. N9 ..... 6.85
Seattle B3 ..... 7.75
Sharon,Pa. S3 ..... 6.85
S.Chicago,Ill. U5, W14 .. 6.85
SparrowsPoint,Md. B2 .. 6.85
Youngstown Y1 ..... 6.85

FLOOR PLATES

Cleveland J5 ..... 5.925
Conshohocken,Pa. A3 .. 5.925
Harrisburg,Pa. P4 .... 6.275
Ind.Harbor,Ind. I-2 .. 5.925
Munhall,Pa. U5 ..... 5.925
S.Chicago,Ill. U5 ..... 5.925

PLATES, Ingot Iron

Ashland c.l. (15) A10 .. 5.10
Ashland l.c.l. (15) A10 .. 5.60
Cleveland c.l. R2 ..... 5.60
Warren,O. c.l. R2 ..... 5.60

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)

Ala.City,Ala.(9) R2 .. 5.075
Aliquippa,Pa.(9) J5 .. 5.075
Alton,Ill. L1 ..... 5.275
Atlanta(9) A11 ..... 5.575
Bessemer,Ala. (9) T2 .. 5.075
Birmingham(9) C15 .... 5.375
Bridgeport,Conn. N19 .. 5.30
Buffalo(9) R2 ..... 5.075
Clairton,Pa. U5 ..... 5.075
Cleveland(9) R2 ..... 5.075
Ecorse,Mich.(9) G5 .... 5.175
Emeryville,Calif. J7 .... 5.85
Fairfield,Ala.(9) T2 .. 5.075
Fairless,Pa.(9) U5 .... 5.225
Fontana,Calif.(9) K1 .. 5.775
Gary,Ind.(9) U5 ..... 5.075
Geneva,Utah(9) C11 .... 5.157
Houston(9) 85 ..... 5.325
Ind.Harbor(9) I-2, Y1 .. 5.075
Johnstown,Pa.(9) B2 .. 5.075
Joliet,Ill. P22 ..... 5.575
KansasCity,Mo.(9) 85 .. 5.325
Lackawanna(9) B2 .... 5.075
LosAngeles(9) B3 .... 5.775
Milton,Pa.(23) M18 .... 5.425
Minnequa,Colo. C10 .... 5.525
Niles,Calif. P1 ..... 5.85
N.T'wanda,N.Y.(9)B11 5.075
Pittsburg,Calif.(9) C11 .. 5.775
Pittsbugh(9) J5 ..... 5.075
Portland,Oreg. O4 ..... 5.85
Seattle B3, N14 ..... 5.825
S.Ch'c'go(9)R2,U5,W14 5.075
S.Duquesne,Pa.(9) U5 .. 5.075
S.SanFran.,Calif.(9) B3 5.825
Sterling,Ill.(1) N15 .. 5.075
Sterling,Ill. N15 ..... 5.175
Struthers,O. Y1 ..... 5.075
Torrance,Calif.(9) C11 .. 5.775
Weirton,W.Va.(9)W6 .. 5.075
Youngstown(9) R2, U5 5.075

BARS, H.R. Looded Alloy (Including leaded extra)

Warren,O. C17 ..... 7.125

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 ..... 6.125
Bridgeport,Conn. N19 .. 6.20
Buffalo R2 ..... 6.125
Canton,O. R2 ..... 6.125
Clairton,Pa. U5 ..... 6.125
Detroit R7 ..... 6.125
Ecorse,Mich. G5 ..... 6.225
Fairless,Pa. U5 ..... 6.275
Fontana,Calif. K1 ..... 7.175
Gary,Ind. U5 ..... 6.125
Houston 85 ..... 6.375
Ind.Harbor,Ind. I-2,Y1 6.125
Johnstown,Pa. B2 ..... 6.125
KansasCity,Mo. 85 ..... 6.375
Lackawanna,N.Y. B2 .. 6.125
LosAngeles B3 ..... 7.175
Massillon,O. R2 ..... 6.125
Midland,Pa. C18 ..... 6.125
S.Chicago R2,U5, W14 6.125
S.Duquesne,Pa. U5 .... 6.125
Struthers,O. Y1 ..... 6.125
Warren,O. C17 ..... 6.125
Youngstown U5 ..... 6.125

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 ..... 7.425
Bessemer,Ala. T2 ..... 7.425
Bethlehem,Pa. B2 ..... 7.425
Bridgeport,Conn. N19 .. 7.50
Clairton,Pa. U5 ..... 7.425
Cleveland R2 ..... 7.425
Ecorse,Mich. G5 ..... 7.525
Fairfield,Ala T2 ..... 7.425
Fontana,Calif. K1 ..... 8.125
Gary,Ind. U5 ..... 7.425
Houston 85 ..... 7.675
Ind.Harbor,Ind. Y1 ..... 7.425
Johnstown,Pa. B2 ..... 7.425
KansasCity,Mo. 85 ..... 7.675
Lackawanna,N.Y. B2 .. 7.425
LosAngeles B3 ..... 8.125
Pittsburgh J5 ..... 7.425
Seattle B3 ..... 8.175
S.Chicago,Ill. U5, W14 7.425
S.Duquesne,Pa. U5 .... 7.425
S.SanFrancisco B3 .... 8.175
Struthers,O. Y1 ..... 7.425
Youngstown U5 ..... 7.425

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa.(9) B2 .. 5.225
Houston 85 ..... 5.325
KansasCity,Mo. 85 .... 5.325
Lackawanna(9) B2 .... 5.075
Sterling,Ill. N15 ..... 5.175
Sterling,Ill.(1) N15 .. 5.075

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 ..... 5.075
Atlanta A11 ..... 5.575
Joliet,Ill P22 ..... 5.10
Niles,Calif. P1 ..... 5.85
Pittsburgh J5 ..... 5.075
Portland,Oreg. O4 ..... 5.85
San Francisco B7 ..... 5.95

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 ..... 6.20
Gary,Ind. U5 ..... 6.20
Houston 85 ..... 6.45
KansasCity,Mo. 85 .... 6.45
Youngstown U5 ..... 6.20

BARS, C.F. Looded Alloy (Including leaded extra)

Ambridge,Pa. W18 .... 9.475
BeaverFalls,Pa. M12 .. 9.475
Chicago W18 ..... 9.475
Cleveland C20 ..... 9.475
LosAngeles S30 ..... 11.10
LosAngeles P2 ..... 11.00
Monaca,Pa. S17 ..... 9.225
Newark,N.J. W18 ..... 9.65
Warren,O. C17 ..... 9.475

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 .... 6.85
BeaverFalls,Pa. M12,R2 6.85
Bridgeport,Conn. N19 .. 7.20
Buffalo B5 ..... 6.90
Camden,N.J. P13 ..... 7.30
Carnegie,Pa. C12 ..... 6.85
Chicago W18 ..... 6.85
Cleveland A7, C20 .... 6.85
Detroit B5, P17 ..... 7.06
Detroit R7 ..... 6.85
Donora,Pa. A7 ..... 6.85
Elyria,O. W8 ..... 6.85
FranklinPark,Ill. N5 .. 6.85
Gary,Ind. U5 ..... 6.85
GreenBay,Wis. F7 ..... 6.85
Hammond,Ind. L2, M13 .. 6.85
Hartford,Conn. R2 ..... 7.35
Harvey,Ill. B5 ..... 6.85
LosAngeles(49) S30 .... 8.30
LosAngeles P2, R2 .... 8.30
Manafield,Mass. B5 .... 7.40
Massillon,O. R2, R8 .... 6.85
Midland,Pa. C18 ..... 6.85
Monaca,Pa. S17 ..... 6.85
Newark,N.J. W18 ..... 7.30
NewCastle,Pa.(17) B4 .. 6.85
Pittsburgh J5 ..... 6.85
Plymouth,Mich. P5 .... 7.10
Putnam,Conn. W18 .... 7.40
Readville,Mass. C14 .... 7.40
S.Chicago,Ill. W14 .... 6.85
SpringCity,Pa. K3 .... 7.30
Struthers,O. Y1 ..... 6.85
Waukegan,Ill. A7 ..... 6.85
Youngstown F3, Y1 .... 6.85

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19 .. 6.10

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 .... 8.325
BeaverFalls,Pa.M12,R2 8.325
Bethlehem,Pa. B2 ..... 8.325
Bridgeport,Conn. N19 .. 8.475
Buffalo B5 ..... 8.325
Camden,N.J. P13 ..... 8.50
Canton,O. T7 ..... 7.425
Carnegie,Pa. C12 ..... 8.325
Chicago W18 ..... 8.325
Cleveland A7, C20 .... 8.325
Detroit B5, P17 ..... 8.535
Detroit R7 ..... 8.325
Donora,Pa. A7 ..... 8.325
Elyria,O. W8 ..... 8.325
FranklinPark,Ill. N5 .. 8.325
Gary,Ind. R2 ..... 8.325
GreenBay,Wis. F7 ..... 8.325
Hammond,Ind. L2, M13 8.325
Hartford,Conn. R2 ..... 8.625
Harvey,Ill. B5 ..... 8.325
Lackawanna,N.Y. B2 .. 8.325
LosAngeles P2, S30 .. 10.10
Manafield,Mass. B5 .. 8.625
Massillon,O. R2, R8 .. 8.325
Midland,Pa. C18 ..... 8.325
Monaca,Pa. S17 ..... 8.375
Newark,N.J. W18 ..... 8.50
Plymouth,Mich. P5 .... 8.525
S.Chicago W14 ..... 8.325
SpringCity,Pa. K3 .... 8.50
Struthers,O. Y1 ..... 8.325
Warren,O. C17 ..... 8.325
Waukegan,Ill. A7 ..... 8.325
Worcester,Mass. A7 .. 8.625
Youngstown F3, Y1 .. 8.325

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 ..... 5.075
Atlanta A11 ..... 5.575
Birmingham C15 ..... 5.375
Bridgeport,Conn. N19 .. 5.30
Buffalo R2 ..... 5.075
Cleveland R2 ..... 5.075
Ecorse,Mich. G5 ..... 5.425
Emeryville,Calif. J7 .... 5.85
Fairfield,Ala. T2 ..... 5.075
Fairless,Pa. U5 ..... 5.225

Ft. Worth, Tex. (42) T4 .5.525
Gary, Ind. U5 .....5.075
Houston S5 .....5.325
Ind. Harbor, Ind. I-2, Y1 5.075
Johnstown, Pa. B2 ....5.075
Joliet, Ill. P22 .....5.575
KansasCity, Mo. S5 ....5.325
Lackawanna, N.Y. B2 .5.075
LosAngeles B3 .....5.775
Milton, Pa. M18 .....5.225
Minnequa, Colo. C10 ..5.525
Niles, Calif. P1 .....5.85
Pittsburg, Calif. C11 ..5.775
Pittsburgh J5 .....5.075
Portland, Oreg. O4 .....5.85
SandSprings, Okla. S5 ..5.575
Seattle B3, N14 .....5.825
S. Chicago, Ill. R2 .....5.075
S. Duquesne, Pa. U5 ....5.075
S. SanFrancisco B3 ....5.825
SparrowsPoint, Md. B2 .5.075
Sterling, Ill. (1) N15 ...5.075
Sterling, Ill. N15 .....5.175
Struthers, O. Y1 .....5.075
Torrance, Calif. C11 ...5.775
Youngstown R2, U5 ..5.975

BARS, Reinforcing
(Fabricated; to Consumers)

Chicago U8 .....6.81
Cleveland U8 .....6.79
Johnstown, Pa. ¼-1" B2.6.73
KansasCity, Mo. S5 ....7.00
Marion, O. P11 .....6.70
New York U8 .....7.18
Pittsburgh U8 .....6.75
Seattle B3, N14 .....7.20
SparrowsPt. ⅛-1" B2 ..6.73
Williamsport, Pa. S19 ..6.65

RAIL STEEL BARS

ChicagoHts. (3) C2, I-2.5.075
ChicagoHts. (4) I-2 ....5.075
ChicagoHts. (4) C2 ....5.65
Ft. Worth, Tex. (26) T4..5.525
Franklin, Pa. (4) F5 ....5.60
Franklin, Pa. (3) F5 ....5.10
JerseyShore, Pa. (4) J8 ..5.00
Marion, O. (3) P11 .....5.15
Moline, Ill. (3) R2 .....5.225
Tonawanda (3) B12 ....5.65
Tonawanda (4) B12 .....6.15
Williamsport, Pa. (3) S19.5.65

BARS, Wrought Iron

Economy, Pa. (S.R.) B14 12.305
Economy, Pa. (D.R.) B14 15.301
Economy (Staybolt) B14 15.676
McK. Rks. (S.R.) L5 ...13.15
McK. Rks. (D.R.) L5 ...18.00
McK. Rks. (Staybolt) L5 .19.50

SHEETS

SHEETS, Hot-Rolled Steel
(18 Gage and Heavier)

Ala. City, Ala. R2 .....4.675
Allenport, Pa. P7 .....4.675
Ashland, Ky. (8) A10 ..4.675
Cleveland J5, R2 .....4.675
Conshohocken, Pa. A3 ..4.725
Detroit (8) M1 .....4.775
Dravosburg, Pa. U5 ....4.675
Ecorse, Mich. G5 .....4.775
Fairfield, Ala. T2 .....4.675
Fairless, Pa. U5 .....4.725
Fontana, Calif. K1 ....5.475
Gary, Ind. U5 .....4.675
Geneva, Utah C11 .....4.775
GraniteCity, Ill. (8) G4 ..4.875
Ind. Harbor, Ind. I-2, Y1 4.675
Lackawanna, N.Y. B2 ..4.675
Munhall, Pa. U5 .....4.675
Newport, Ky. (8) N9 ..4.675
Niles, O. M21 .....4.675
Pittsburg, Calif. C11 ..5.375
Pittsburgh J5 .....4.675
Portsmouth, O. P12 ....4.675
Riverdale, Ill. A1 .....4.675
Sharon, Pa. S3 .....4.675
S. Chicago, Ill. W14 ....4.675
SparrowsPoint, Md. B2..4.675
Steubenville, O. W10 ..4.675
Warren, O. R2 .....4.675
Weirton, W. Va. W6 ....4.675
Youngstown U5, Y1 ..4.675

SHEETS, H.R., (19 Ga. & Lighter)

Niles, O. M21 .....5.75

SHEETS, H.R. Alloy

Dravosburg, Pa. U5 ....7.75
Gary, Ind. U5 .....7.75
Ind. Harbor, Ind. Y1 ....7.75
Newport, Ky. N9 .....7.75
Youngstown Y1, U5 ....7.75

SHEETS, H.R. (14 Ga. & Heavier)
High-Strength Low-Alloy

Cleveland J5, R2 .....6.90
Conshohocken, Pa. A3 ..6.95
Dravosburg, Pa. U5 ....6.90
Ecorse, Mich. G5 .....7.00
Fairfield, Ala. T2 .....6.90
Fairless, Pa. U5 .....6.95
Fontana, Calif. K1 .....7.70
Gary, Ind. U5 .....6.90
Ind. Harbor, Ind. I-2, Y1 6.90
Lackawanna (35) B2 ....6.90
Munhall, Pa. U5 .....6.90
Pittsburgh J5 .....6.90
S. Chicago, Ill. U5 .....6.90
SparrowsPoint (36) B2 ..6.90
Warren, O. R2 .....6.90
Weirton, W. Va. W6 ....6.90
Youngstown U5, Y1 ....6.90

SHEETS, Hot-Rolled Ingot Iron
(18 Gage and Heavier)

Ashland, Ky. (8) A10 ...4.925
Cleveland R2 .....5.425
Ind. Harbor, Ind. I-2 ..4.925
Warren, O. R2 .....5.425

SHEETS, Cold-Rolled Steel
(Commercial Quality)

Allenport, Pa. P7 .....5.75
Cleveland J5, R2 .....5.75
Conshohocken, Pa. A3 ...5.80
Detroit M1 .....5.75
Dravosburg, Pa. U5 ....5.75
Ecorse, Mich. G5 .....5.85
Fairfield, Ala. T2 .....5.75
Fairless, Pa. U5 .....5.80
Follansbee, W. Va. F4 ..5.75
Fontana, Calif. K1 ....6.95
Gary, Ind. U5 .....5.75
GraniteCity, Ill. G4 ....5.95
Ind. Harbor, Ind. I-2, Y1 5.75
Lackawanna, N.Y. B2 ..5.75
Mansfield, O. E6 .....5.75
Middletown, O. A10 ....5.75
Newport, Ky. N9 .....5.75
Pittsburg, Calif. C11 ...6.70
Pittsburgh J5 .....5.75
Portsmouth, O. P12 ....5.75
SparrowsPoint, Md. B2 ..5.75
Steubenville, O. W10 ....5.75
Warren, O. R2 .....5.75
Weirton, W. Va. W6 ....5.75
Yorkville, O. W10 .....5.75
Youngstown Y1 .....5.75

SHEETS, Cold-Rolled
High-Strength, Low-Alloy

Cleveland J5, R2 .....8.525
Dravosburg, Pa. U5 ....8.525
Ecorse, Mich. G5 .....8.625
Fairless, Pa. U5 .....8.575
Fontana, Calif. K1 ....9.725
Gary, Ind. U5 .....8.525
IndianaHarbor, Ind. Y1..8.525
Lackawanna (37) B2 ..8.525
Pittsburgh J5 .....8.525
SparrowsPoint (38) B2 .8.525
Warren, O. R2 .....8.525
Weirton, W. Va. W6 ....8.525
Youngstown Y1 .....8.525

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.50
Middletown, O. A10 ....6.25
Warren, O. R2 .....6.50

SHEETS, Culvert	Cu Steel	Cu Fe
Ashland, Ky. A10	6.65	6.90
Canton, O. R2	6.65	7.15
Dravosburg U5	6.65	6.90
Fairfield T2	6.65	6.90
Gary, Ind. U5	6.65	6.90
GraniteCity, Ill. G4	6.85	...
Ind. Harbor I-2	6.65	6.90
Kokomo, Ind. C16	6.75	...
MartinsFry. W10	6.65	...
Pittsburgh J5	...	6.85
Pitts., Calif. C11	7.40	...
SparrowsPt. B2	6.65	...

SHEETS, Culvert—Pure Iron

Dravosburg, Pa. U5 ....6.90
Gary, Ind. U5 .....6.90
Ind. Harbor, Ind. I-2 ....6.90
MartinsFry., O. W10 ....6.90

SHEETS, Galvanized Steel
Hot-Dipped

Ala. City, Ala. R2 .....6.30‡
Ashland, Ky. A10 .....6.30†
Canton, O. R2 .....6.30‡
Dover, O. R1 .....6.30†
Dravosburg, Pa. U5 ....6.30†
Fairfield, Ala. T2 .....6.30†
Gary, Ind. U5 .....6.30†
GraniteCity, Ill. G4 ....6.80*
Ind. Harbor, Ind. I-2 ..6.30†
Kokomo, Ind. C16 .....6.40‡
MartinsFerry, O. W10 ..6.30*
Middletown, O. A10 ....6.30†
Pittsburg, Calif. C11 ...7.05*
Pittsburgh J5 .....6.30†
SparrowsPt., Md. B2 ..6.30†
Warren, O. R2 .....6.30†
Weirton, W. Va. W6 ....6.30*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Wall Casing

Fontana, Calif. K1 ....6.975

SHEETS, Galvanized
High-Strength Low-Alloy

Dravosburg, Pa. U5 ...9.275
SparrowsPoint (39) B2..9.275

SHEETS, Galvannealed Steel

Canton, O. R2 .....6.70
Dravosburg, Pa. U5 ....6.70
Kokomo, Ind. C16 .....7.00

SHEETS, Galvanized Ingot Iron
(Hot-dipped Continuous)

Ashland, Ky. A10 .....6.55
Middletown, O. A10 ....6.55

SHEETS, Electrogalvanized

Cleveland (28) R2 ....7.125
Niles, O. (28) R2 .....7.125
Weirton, W. Va. W6 ....6.975

SHEETS, Aluminum Coated

Butler, Pa. A10 (type 1) 8.95
Butler, Pa. A10 (type 2) 9.05

SHEETS, Enameling Iron

Ashland, Ky. A10 .....6.325
Cleveland R2 .....6.325
Dravosburg, Pa. U5 ....6.325
Gary, Ind. U5 .....6.325
GraniteCity, Ill. G4 ....6.525
Ind. Harbor, Ind. I-2, Y1 6.325
Middletown, O. A10 ....6.325
Niles, O. M21 .....6.325
Youngstown Y1 .....6.325

BLUED STOCK, 29 Gage

Follansbee, W. Va. F4 ..8.35
Ind. Harbor, Ind. I-2 ....8.175
Yorkville, O. W10 .....8.175

SHEETS, Long Terne Steel
(Commercial Quality)

BeechBottom, W. Va. W10 8.70
Gary, Ind. U5 .....6.70
Mansfield, O. E6 .....6.70
Middletown, O. A10 ....6.70
Niles, O. M21 .....6.70
Weirton, W. Va. W6 ....6.70

SHEETS, Long Terne, Ingot Iron

Middletown, O. A10 ....7.10

Key To Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U.S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Dearborn Division Sharon Steel Corp.
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 EasternGas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine&Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Division, Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.

N1 National Standard Co.
N2 National Supply Co.
N3 National Tube Div., U.S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest. SteelRoll. Mill
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co. Sub. of Bartium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div. Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service

T2 Tenn. Coal & Iron Div., U.S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U.S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U.S. Steel Supply Div., U.S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co., Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.675
Allenport,Pa. P7	4.675
Alton,Ill. L1	4.875
Ashland,Ky.(8) A10	4.675
Atlanta A11	4.875
Bessemer,Ala. T2	4.675
Birmingham C15	4.975
Bridgeport,Conn. N19	4.625
Buffalo(27) R2	4.675
Conshohocken,Pa. A3	4.725
Detroit M1	4.775
Ecorse,Mich. G5	4.775
Fairfield,Ala. T2	4.675
Fontana,Calif. K1	5.475
Gary,Ind. U5	4.675
Houston S5	4.925
Ind.Harbor,Ind. I-2, Y1	4.675
Johnstown,Pa.(25) B2	4.675
KansasCity,Mo. S5	4.925
Lackaw'na,N.Y.(25) B2	4.625
LosAngeles(25) B3	5.425
Minnequa,Colo. C10	5.775
Pittsburg,Calif. C11	5.425
Riverdale,Ill. A1	4.675
SanFrancisco S7	5.95
Seattle(25) B3	5.675
Seattle N14	5.675
Sharon,Pa. S3	4.675
S.Chicago,Ill. W14	4.675
S.SanFrancisco(25) B3	5.425
SparrowsPoint,Md. B2	4.675
Sterling,Ill.(1) N15	4.675
Sterling,Ill. N15	4.775
Torrance,Calif. C11	5.425
Warren,O. R2	4.675
Weirton,W.Va. W6	4.675
Youngstown U5	4.675

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19	7.50
Carnegie,Pa. S18	7.75
Dravosburg,Pa. U5	7.75
Gary,Ind. U5	7.75
Ind.Harbor,Ind. Y1	7.75
LosAngeles B3	8.95
Newport,Ky. N9	7.75
Sharon,Pa. S3	7.75
S.Chicago,Ill. W14	7.75
Youngstown U5, Y1	7.75

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2	6.95
Conshohocken,Pa. A3	6.95
Ecorse,Mich. G5	7.05
Fairfield,Ala. T2	6.95
Gary,Ind. U5	6.95
Houston S5	7.20
Ind.Harbor,Ind. I-2, Y1	6.95
KansasCity,Mo. S5	7.20
Lackawanna,N.Y. B2	6.95
LosAngeles(25) B3	7.70
Seattle(25) B3	7.95
Sharon,Pa. S3	6.95
S.SanFrancisco(25) B3	7.70
SparrowsPoint,Md. B2	6.95
Warren,O R2	6.95
Weirton,W.Va. W6	6.95
Youngstown U5, Y1	6.95

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.925
Warren,O. R2	5.425

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	6.85
Baltimore T6	6.85
Boston T6	7.40
Buffalo S40	6.85
Cleveland A7, J5	6.85
Conshohocken,Pa. A3	6.90
Dearborn,Mich. D3	6.95
Detroit D2, M1, P20	6.95
Dover,O. G6	6.85
Ecorse,Mich. G5	6.95
Follansbee,W.Va. F4	6.85
Fontana,Calif. K1	8.60
FranklinPark,Ill. T6	6.95
Ind.Harbor,Ind. Y1	6.85
Indianapolis C8	7.00
LosAngeles C1	8.80
NewBedford,Mass. R10	7.30
NewBritain(10) S15	6.85
NewCastle,Pa. B4, E5	6.85
NewHaven,Conn. D2	7.30
NewKensington,Pa. A6	6.85
Pawtucket,R.I. R3	7.50
Pawtucket,R.I. N8	7.40
Pittsburgh J5	6.85
Riverdale,Ill. A1	6.95
Rome,N.Y.(32) R6	6.85
Sharon,Pa. S3	6.85
Trenton,N.J.(31) R5	8.30
Wallingford,Conn. W2	7.30
Warren,O. R2, T5	6.85
Weirton,W.Va. W6	6.85
Worcester,Mass. A7	7.40
Youngstown C8, Y1	6.85

STRIP, Cold-Rolled Alloy

Boston T6	14.90
Carnegie,Pa. S18	14.55
Cleveland A7	14.55
Dover,O G6	14.55
FranklinPark,Ill. T6	14.55
Harrison,N.J. C18	14.55
Indianapolis C8	14.70
Pawtucket,R.I. N8	14.90
Sharon,Pa. S3	14.55
Worcester,Mass. A7	14.85
Youngstown C8	14.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.00
Dearborn,Mich. D3	10.10
Dover,O. G6	10.10
Ecorse,Mich. G5	10.10
Ind.Harbor,Ind. Y1	10.20
Sharon,Pa. S3	10.00
Warren,O. R2	10.00
Weirton,W.Va. W6	10.20
Youngstown Y1	10.20

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	8.50	10.10	12.90	15.30	18.25
Boston T6	8.50	10.10	12.90	15.30	18.25
Bristol,Conn. W1	...	...	12.90	15.30	18.25
Carnegie,Pa. S18	...	9.80	12.60	15.00	....
Cleveland A7	7.95	9.80	12.00	15.00	17.95
Cleveland C7	...	9.80	12.60	15.00	17.95
Dover,O. G6	7.95	9.80	12.60	15.00	17.95
Detroit D2	8.05	9.90	12.70	15.10	....
Dearborn,Mich. D3	8.05	9.90	12.10	....	....
FranklinPark,Ill. T6	8.05	9.80	12.60	15.00	17.95
Harrison,N.J. C18	...	...	12.90	15.30	18.25
Indianapolis C8	8.10	9.95	12.60	15.00	17.95
NewBritain,Conn.(10) S15	7.95	9.80	12.60	15.00	17.95
NewCastle,Pa. B4, E5	7.95	9.80	12.60	15.00	....
NewHaven,Conn. D2	8.40	10.10	12.30	15.30	....
NewKensington,Pa. A6	7.95	9.80	12.60	15.00	....
NewYork W3	...	10.10	12.90	15.30	18.25
Pawtucket,R.I. N8	8.50	10.10	12.90	15.30	18.25
Riverdale,Ill. A1	8.05	9.80	12.00	15.00	17.95
Rome,N.Y.(32) R6	7.95	9.80	12.60	15.00	17.95
Sharon,Pa. S3	7.95	9.80	12.60	15.00	17.95
Trenton,N.J. R5	...	10.10	12.90	15.30	18.25
Wallingford,Conn. W2	8.40	10.10	12.90	15.30	18.15
Warren,O. T5	7.95	9.80	12.60	15.00	17.95
Weirton,W.Va. W6	7.95	9.80	12.60	15.00	17.95
Worcester,Mass. A7, ...	8.50	10.10	12.30	15.30	18.25
Worcester,Mass. T6	8.50	10.10	12.90	15.30	18.25
Youngstown C8	7.95	9.80	12.60	15.00	17.95

Spring Steel (Tempered)			Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	...	...	16.80	20.65	....
Buffalo W12	...	...	16.80	....	....
FranklinPark,Ill. T6	...	...	17.15	21.00	25.35
Harrison,N.J. C18	...	...	16.80	20.65	25.00
NewYork W3	...	...	16.80	20.65	25.00
Palmer,Mass. W12	...	...	16.80	....	....
Trenton,N.J. R5	...	...	16.80	20.65	25.00
Worcester,Mass A7, J6	...	...	16.80	20.65	25.00
Youngstown C8	...	...	17.15	21.00	25.35

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	7.60

STRIP, Electrogalvanized

Cleveland A7	6.85*
Dover,O. G6	6.85*
Riverdale,Ill. A1	6.95*
Warren,O. B9, T5	6.85*
Worcester,Mass. A7	7.40*
Youngstown C8	6.85*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	6.975

TIGHT COOPERAGE HOOP

Atlanta A11	5.40
Riverdale,Ill. A1	5.25
Sharon,Pa. S3	5.10
Youngstown U5	5.10

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	...	...	11.00	12.05	13.05
Brackenridge,Pa. A4	...	...	11.00	12.05	13.05
Mansfield,O. E6	9.20	10.35	11.00	12.05	13.05
Newport,Ky. N9	9.20	10.35	11.00	12.05	13.05
Niles,O. M21	9.20	10.35	11.00	12.05	....
Vandergrift,Pa. U5	...	10.35	11.00	12.05	13.05
Warren,O. R2	9.20	10.35	11.00	12.05	....
Zanesville,O. A10	...	10.35	11.00	12.05	13.05
Zanesville,O. A10 (FP coils)	...	10.85	11.525	12.575	13.55
Zanesville,O. A10 (SP coils)	...	....	11.025	12.075	13.05

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed 1/2c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	...	...	11.525	12.575	13.55
GraniteCity,Ill. G4	9.40*	10.55*	11.225	*12.275*	....
IndianaHarbor,Ind. I-2	9.20†	10.35*	11.025	*12.075*	....
Mansfield,O. E6	9.70	10.85	11.525	12.575	13.55
Vandergrift,Pa. U5	9.20*	10.35*	11.025	*12.075	*13.05*
Vandergrift,Pa. U5	...	10.85†	11.525	†12.575	†13.55†
Warren,O. R2	9.20*	10.85	11.525	12.575	13.55

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grades T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	14.05	14.60	15.10	16.15
Brackenridge,Pa. A4	14.05	....	....	....
Vandergrift,Pa. U5	14.05	14.60	15.10	16.15
Zanesville,O. A10	14.05	14.60	15.10	16.15

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	16.90	18.50	19.00	19.50	14.05**
Butler,Pa. A10	....	....	18.50	19.00	19.50	....
Vandergrift,Pa. U5	15.90	16.90	18.50	19.00	19.50	14.55**
Warren,O. R2	....	....	....	....	....	14.55‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed 1/2c lower. **Cut lengths, 1/4-cent lower.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.40	$8.65	$9.05
Dravosburg,Pa. U5	8.40	8.65	9.05
Fairfield,Ala. T2	8.50	8.75	9.15
Fairless,Pa. U5	8.50	8.75	9.15
Fontana,Calif. K1	9.15	9.40	9.80
Gary,Ind. U5	8.40	8.65	9.05
GraniteCity,Ill. G4	8.50	8.75	9.15
IndianaHarbor,Ind. I-2, Y1	8.40	8.65	9.05
Niles,O. R2	8.40	8.65	9.05
Pittsburg,Calif. C11	9.15	9.40	9.80
SparrowsPoint,Md. B2	8.50	8.75	9.15
Weirton,W.Va. W6	8.40	8.65	9.05
Yorkville,O. W10	8.40	8.65	9.05

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	7.425	....	....
Niles,O. R2	7.425	7.625	7.825

TINPLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$9.70	$9.95
Dravosburg,Pa. U5	9.70	9.95
Fairfield,Ala. T2	9.80	10.05
Fairless,Pa. U5	9.80	10.05
Fontana,Calif. K1	10.45	10.70
Gary,Ind. U5	9.70	9.95
Ind. Harbor Y1	9.70	9.95
Pitts.,Calif. C11	10.45	10.70
Sp.Pt.,Md. B2	9.80	10.05
Weirton,W.Va. W6	9.70	9.95
Yorkville,O. W10	9.70	9.95

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$7.50
Dravosburg,Pa. U5	7.50
Fairfield,Ala. T2	7.60
Fairless,Pa. U5	7.60
Fontana,Calif. K1	8.25
Gary,Ind. U5	7.50
GraniteCity,Ill. G4	7.60
Ind.Harbor,Ind. I-2, Y1	7.50
Niles,O. R2	7.50
Pittsburg,Calif. C11	8.25
SparrowsPoint,Md. B2	7.60
Weirton,W.Va. W6	7.50
Yorkville,O. W10	7.50

HOLLOWARE ENAMELING Black Plate (29 Gage)	
Aliquippa,Pa. J5	$7.15
Dravosburg,Pa. U5	7.15
Gary,Ind. U5	7.15
GraniteCity,Ill. G4	7.25
Ind.Harbor,Ind. Y1	7.15
Yorkville,O. W10	7.15

MANUFACTURING TERNES (Special Coated; Base Box)	
Dravosburg,Pa. U5	$9.20
Gary,Ind. U5	9.20

ROOFING SHORT TERNES (8 lb Coated; Base Box)	
Gary,Ind. U5	$10.75

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	7.20
Aliquippa,Pa. J5	7.20
Alton,Ill. L1	7.40
Atlanta A11	7.40
Bartonville,Ill. K4	7.30
Buffalo W12	7.20
Chicago W13	7.20
Cleveland A7, C20	7.20
Crawfordsville,Ind. M8	7.30
Donora,Pa. A7	7.20
Duluth A7	7.20
Fairfield,Ala. T2	7.20
Fostoria,O.(24) S1	7.30
Houston S5	7.45
Jacksonville,Fla. M8	7.55
Johnstown,Pa. B2	7.20
Joliet,Ill. A7	7.20
KansasCity,Mo. S5	7.45
Kokomo,Ind. C16	7.30
LosAngeles B3	8.15
Minnequa,Colo. C10	7.45
Monessen,Pa. P7, P16	7.20
N.Tonawanda,N.Y. B11	7.20
Palmer,Mass. W12	7.50
Pittsburg,Calif. C11	8.15
Portsmouth,O. P12	7.20
Rankin,Pa. A7	7.20
S.Chicago,Ill. R2	7.20
S.SanFrancisco C10	8.15
SparrowsPoint,Md. B2	7.30
Sterling,Ill.(1) N15	7.20
Sterling,Ill. N15	7.30
Struthers,O. Y1	7.20
Waukegan,Ill. A7	7.20
Worcester,Mass. A7	7.50

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4	11.75
Buffalo W12	11.75
Johnstown,Pa. B2	11.75
Minnequa,Colo. C10	11.875
Monessen,Pa. P16	11.75
Muncie,Ind. I-7	11.95
Palmer,Mass. W12	12.05
Pittsburg,Calif. C11	12.55
Portsmouth,O. P12	11.75
Roebling,N.J. R5	12.05
SparrowsPt.,Md. B2	11.85
Struthers,O. Y1	11.75

ROPE WIRE (A)

Bartonville,Ill. K4	11.55
Buffalo W12	11.55
Fostoria,O. S1	11.55
Johnstown,Pa. B2	11.55
Monessen,Pa. P7, P16	11.55
Muncie,Ind. I-7	11.75
Palmer,Mass. W12	11.85
Portsmouth,O. P12	11.55
Roebling,N.J. R5	11.85
SparrowsPt.,Md. B2	11.65
Struthers,O. Y1	11.55
Worcester,Mass. J4	11.85

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Upholstery Spring

Aliquippa,Pa. J5	8.40
Alton,Ill. L1	8.60
Buffalo W12	8.40
Cleveland A7	8.40
Donora,Pa. A7	8.40
Duluth A7	8.40
Johnstown,Pa. B2	8.40
KansasCity,Mo. S5	8.65
LosAngeles B3	9.35
Minnequa,Colo. C10	8.60
Monessen,Pa. P7, P16	8.40
NewHaven,Conn. A7	8.70
Palmer,Mass. W12	8.70
Pittsburg,Calif. C11	9.35
Portsmouth,O. P12	8.40
Roebling,N.J. R5	8.70
S.Chicago,Ill. R2	8.40
S.SanFrancisco C10	9.35
SparrowsPoint,Md. B2	8.50
Struthers,O. Y1	8.40
Trenton,N.J. A7	8.70
Waukegan,Ill. A7	8.40
Worcester,Mass. A7	8.70

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	8.725
Alton,Ill. L1	8.925
Bartonville,Ill. K4	8.825
Buffalo W12	8.725
Cleveland A7	8.725
Donora,Pa. A7	8.725
Duluth A7	8.725
Fostoria,O. S1	8.775
Johnstown,Pa. B2	8.725
LosAngeles B3	9.675
Milbury,Mass.(12) N6	9.025
Minnequa,Colo. C10	8.975
Monessen,Pa. P7, P16	8.725
Muncie,Ind. I-7	8.925
Palmer,Mass. W12	9.025
Pittsburg,Calif. C11	9.675
Portsmouth,O. P12	8.725
Roebling,N.J. R5	9.025
S.Chicago,Ill. R2	8.725
S.SanFrancisco C10	9.675
SparrowsPt.,Md. B2	8.825
Struthers,O. Y1	8.725
Trenton,N.J. A7	9.025
Waukegan,Ill. A7	8.725
Worcester A7, J4, T6	9.025

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	14.35
Bartonville,Ill. K4	14.25
Buffalo W12	14.15
Chicago W13	13.55
Cleveland A7	14.15
Crawfordsville,Ind. M8	14.25
Fostoria,O. S1	14.15
Jacksonville,Fla. M8	14.50
Johnstown,Pa. B2	14.15
Kokomo,Ind. C16	14.15
Minnequa,Colo. C10	13.90
Monessen,Pa. P6	14.15
Muncie,Ind. I-7	14.35
Palmer,Mass. W12	14.45
Roebling,N.J. C10	14.45
S.SanFrancisco C10	14.50
Waukegan,Ill. A7	14.15
Worcester,Mass. A7, T6	14.45

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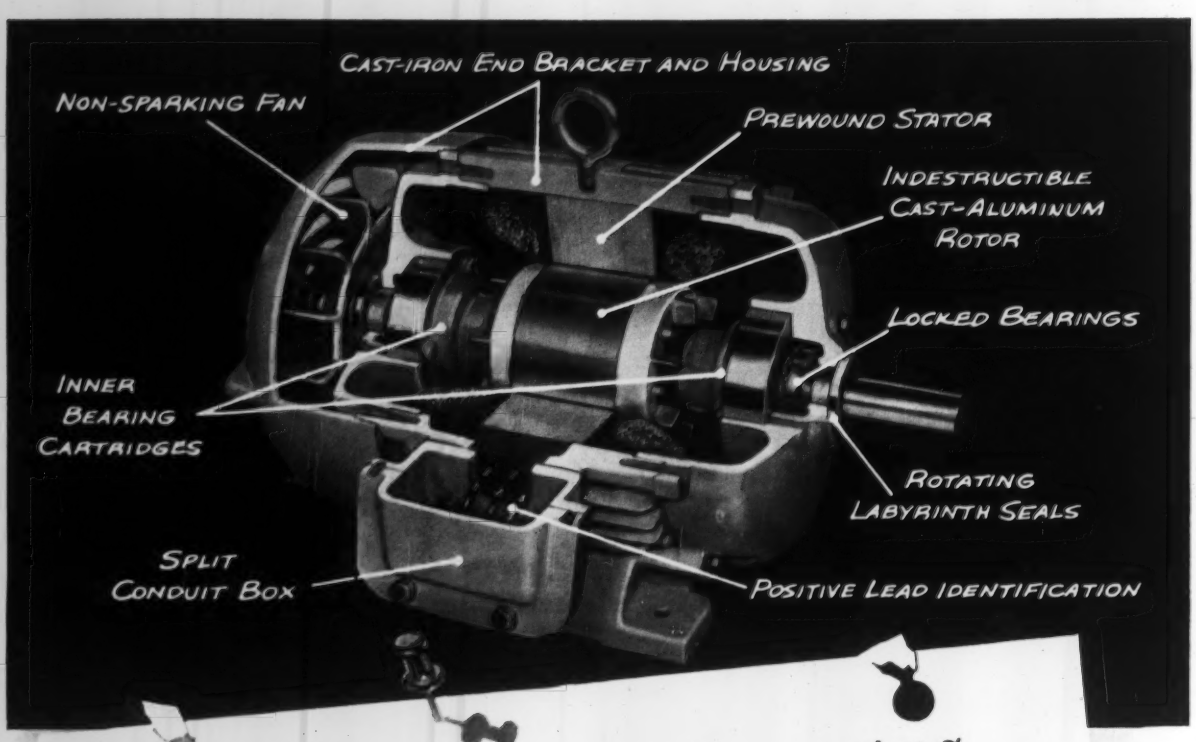
ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. & 5 PITTSBURGH ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 2340 GLENDALE-MILFORD RD. • EVERETT, CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 1900 15TH ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1520 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • ROCHESTER, 1 FLINT ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • ST. LOUIS, 3001 DELMAR BLVD. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK



Are you getting all these extras in the motors you buy?

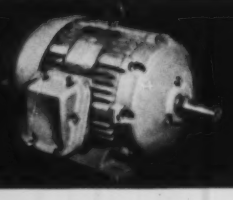
Louis Allis gives them to you in the new L. A. enclosed and explosion-proof motors

For years, Louis Allis has specialized in special motors for many of industry's toughest drive problems. Such installations call for extreme care in both motor design and manufacture—care that has become a habit with us. We build our enclosed and explosion-proof motors with the same special care.

What does this mean to you? It means that you get a motor with extra features—a motor that runs better, lasts longer. Here are a few of the extra reasons why:

- These new motors carry Underwriters' label for use in four groups of hazardous locations—Class I, Group D, and Class II, Groups E, F, and G. This four-group approval for a single motor simplifies your stocking problem.
- New, exclusive phenolic impregnating varnish provides high thermal and chemical resistance. It remains resilient and resists aging, prolonging the life of the motor.
- Inner bearing cartridges lock bearings to end bracket and form explosion-quenching seal along the shaft. Inner race of bearing locked to shaft, reducing end play—an extra quality feature.
- Rotating labyrinth seals keep dirt and moisture out of the bearings—keep grease in.

There are many other features such as a new diagonally split conduit box, sturdy cast-iron construction, positive lead identification, non-sparking fan. Our new bulletin No. 1700 shows why you get extra value for your dollar in a Louis Allis explosion-proof motor. Write for your copy.



New LA line explosion-proof motors are available in rerated frame sizes 182 through 326U, and in ratings of 1 to 30 hp, 3 phase, and 1 to 5 hp, single phase. Also available with Underwriters' approval for Class I, Group C hazardous locations.

EP-102

THE LOUIS ALLIS CO.
MILWAUKEE 7, WISCONSIN

WIRE

WIRE, Tire Bead

Bartonville,Ill. K4	15.25
Monessen,Pa. P16	14.45
Roebling,N.J. R5	14.35

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	10.75
Baltimore T6	11.05
Boston T6	11.05
Buffalo W12	10.75
Cleveland A7	10.75
Crawfordsville,Ind. M8	10.75
Dover,O. G6	10.75
Fostoria,O. S1	10.75
FranklinPark,Ill. T6	10.85
Kokomo,Ind. C16	10.75
Massillon,O. R8	10.75
Milwaukee C23	10.95
Monessen,Pa. P7, P16	10.75
NewKensington,Pa. A6	10.75
Palmer,Mass. W12	11.05
Pawtucket,R.I. N8	11.05
Riverdale,Ill. A1	10.85
Rome,N.Y. R6	10.75
Trenton,N.J. R5	11.05
Worcester,Mass. A7, T6	11.05

NAILS & POLISHED STAPLES,

Stock	Col.
AlabamaCity, Ala. R2	.164
Aliquippa,Pa. (7) J5	.167
Atlanta A11	.166
Bartonville,Ill. (7) K4	.169
Crawfordsville,Ind.(7)M8	169
Donora,Pa. A7	.164
Duluth A7	.164
Fairfield,Ala. T2	.164
Houston,Tex. S5	.169
Jack'ville,Fla.(7)(20)M8	178
Johnstown,Pa. B2	.164
Joliet,Ill. A7	.164
KansasCity,Mo. S5	.169
Kokomo,Ind. C16	.166
Minnequa,Colo. C10	.169
Monessen,Pa. (7) P7	.167
Pittsburg,Calif. C11	.183
Rankin,Pa. A7	.164
S.Chicago,Ill. R2	.164
SparrowsPt.,Md. B2	.166
Sterling,Ill. (1) N15	.164
Worcester,Mass. A7	.170

NAILS, Stock

Chicago (7) W13	.167
Cleveland (7) A9	.173

(To Wholesalers; per cwt)

Galveston,Tex. D7	$8.75

NAILS, Cut (100 lb keg)

To Dealers (33)	
Conshohocken,Pa. A3	$9.80
Wheeling,W.Va. W10	9.80

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)

Coil No. 3150	
AlabamaCity,Ala. R2	$9.53
Atlanta A11	9.63
Bartonville,Ill. K4	10.13
Buffalo W12	10.05
Crawfordsville,Ind. M8	10.13
Donora,Pa. A7	9.53
Duluth A7	9.53
Houston S5	9.78
Jacksonville,Fla. M8	10.58
Johnstown,Pa. B2	9.53
Joliet,Ill. A7	9.53
KansasCity,Mo. S5	9.78
Kokomo,Ind. C16	9.63
LosAngeles B3	10.32
Minnequa,Colo. C10	9.78
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.53
S.SanFrancisco C10	10.31
SparrowsPt.,Md. B2	9.63
Sterling,Ill.(1) N15	9.53

Coil No. 6500 Stand.	
AlabamaCity,Ala. R2	$9.85
Atlanta A11	9.95
Bartonville,Ill. K4	10.45
Buffalo W12	10.35
Crawfordsville,Ind. M8	10.45
Donora,Pa. A7	9.85
Duluth A7	9.85
Houston S5	10.10
Kokomo,Ind. C16	9.95
Jacksonville,Fla. M8	10.91
Johnstown,Pa. B2	9.85
Joliet,Ill. A7	9.85
KansasCity,Mo. S5	10.10
Kokomo,Ind. C16	10.45
LosAngeles B3	10.65
Minnequa,Colo. C10	10.10
Pittsburg,Calif. C11	10.65
S.Chicago,Ill. R2	9.85
S.SanFrancisco C10	10.65
SparrowsPt.,Md. B2	9.95
Sterling,Ill.(1) N15	9.85

Coil Interim

AlabamaCity,Ala. R2	$9.90
Atlanta A11	10.00
Bartonville,Ill. K4	10.50
Buffalo W12	10.40
Crawfordsville,Ind. M8	10.50
Donora,Pa. A7	9.90
Duluth A7	9.90
Houston S5	10.15
Jacksonville,Fla. M8	10.96
Johnstown,Pa. B2	9.90
Joliet,Ill. A7	9.90
KansasCity,Mo. S5	10.15
Kokomo,Ind C16	10.00
LosAngeles B3	10.70
Minnequa,Colo. C10	10.15
Pittsburg,Calif. C11	10.70
S.Chicago,Ill. R2	9.90
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	10.00
Sterling,Ill.(1) N15	9.90

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	.184••
Aliquippa, Pa. J5	.184‖
Atlanta A11	.190•
Bartonville,Ill. K4	.193
Crawfordsville,Ind. M8	.193
Donora,Pa. A7	.184†
Duluth A7	.184†
Fairfield,Ala. T2	.184†
Houston,Tex. S5	.189••
Jacksonville,Fla. M8	.198
Johnstown,Pa. B2	.188•
Joliet,Ill. A7	.184†
KansasCity,Mo. S5	.189••
Kokomo,Ind. C16	.186†
Minnequa,Colo. C10	.189••
Monessen,Pa. P7	.191•
Pittsburg,Calif. C11	.204†
Rankin,Pa. A7	.184†
S.Chicago,Ill. R2	.184••
S.SanFrancisco C10	.207••
SparrowsPoint,Md. B2	190•
Sterling,Ill(1) N15	.188•

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	176••
Aliq'ppa,Pa. 9-14½ga.J5	184‖
Atlanta A11	182••
Bartonville,Ill. K4	187
Crawfordsville,Ind. M8	187
Donora,Pa. A7	176†
Duluth A7	176†
Fairfield,Ala. T2	176†
Houston,Tex. S5	181••
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	180•
Joliet,Ill. A7	176†
KansasCity,Mo. S5	181••
Kokomo,Ind. C16	178†
Minnequa,Colo. C10	181••
Monessen,Pa. 9 ga. P7	185•
Pittsburg,Calif. C11	199†
Rankin,Pa. A7	176†
S.Chicago,Ill. R2	176••
Sterling,Ill.(1) N15	180•

	An'ld	Galv.
WIRE (16 gage)	**Stone**	**Stone**
Ala.City,Ala.R2	15.70	17.25••
Bartonville K4	16.10	18.05
Buffalo W12	16.10	
Cleveland A7	15.70	17.25†
Crawf'dsville M8	16.20	18.15
Fostoria,O. S1	16.20	17.75†
Houston S5	15.95	17.50••
Jacksonville M8	16.45	18.40
Johnstown B2	16.10	18.05•
Kan.City,Mo.S5	15.95	17.50••
Kokomo C16	15.80	17.35†
Minnequa C10	16.05	17.75••
P'lm'r,Mass.W2	16.10	17.65•
Pitts.,Calif. C11	16.05	17.60†
SparrowsPt. B2	16.20	18.15•
Sterling(1) N15	16.10	18.05•
Waukegan A7	15.70	17.25†
Worcester A7	16.00	

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
Ala.City,Ala. R2	7.95	8.35••
Aliquippa J5	8.10	8.625‖
Atlanta A11	8.05	8.65•
Bartonville(48) K4	8.20	8.80
Buffalo W12	8.10	8.50†
Cleveland A7	7.95	
Crawfordsville M8	8.20	8.80
Donora,Pa. A7	7.95	8.35†
Duluth A7	7.95	8.35†
Fairfield T2	7.95	8.35†
Houston(48) S5	8.20	8.60••
Jacks'ville,Fla. M8	8.45	9.05
Johnstown B2(48)	7.95	8.55•
Joliet,Ill. A7	7.95	8.35†
Kans.City(48) S5	8.20	8.60••
Kokomo C16	8.05	8.45†
LosAngeles B3	8.90	9.50•
Minnequa, C10	8.20	8.60••
Monessen P7 (48)	8.10	8.70•
Palmer,Mass. W12	8.40	8.80•
Pitts.,Calif. C11	8.90	9.30†
Portsmouth,O. P12	*7.95*	
Rankin,Pa. A7	7.95	8.35†
S.Chicago R2	7.95	8.35••
S.SanFran. C10	8.90	9.30••
Spar'wsPt. B2(48)	8.05	8.65•
Sterling(1)(48)N15	7.95	8.55•
Struth'rs,O.(48)Y1	7.95	8.45†
Worcester,Mass.A7	8.25	8.65†

Based on zinc price of: *13.50c, †5c, ‖10c, ‡Less than 10c. ††13. **Subject to zinc equalization extras.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	.190
Atlanta A11	.192
Bartonville,Ill. K4	.197
Crawfordsville,Ind. M8	.197
Donora,Pa. A7	.190
Duluth A7	.190
Fairfield,Ala. T2	.190
Houston S5	195
Jacksonville,Fla. M8	.202
Joliet,Ill. A7	.190
KansasCity,Mo. S5	.195
Kokomo,Ind. C16	.192
Minnequa,Colo. C10	.195
Pitts.,Calif. C11	.214
S.Chicago,Ill. R2	.190
S.SanFrancisco C10	.214
SparrowsPoint.,Md. B2	.192
Sterling,Ill. N15	.190
Tonawanda,N.Y. B12	.169
Williamsport,Pa. S19	.175

FENCE POSTS

ChicagoHts.,Ill. C2, I-2	.167
Duluth A7	.167
Franklin,Pa. F5	.167
Huntington,W. Va. W7	.169
Johnstown,Pa. B2	.167
Marion,O. P11	.167
Minnequa,Colo. C10	.172
Sterling,Ill. N15	.167
Tonawanda,N.Y. B12	.169
Williamsport,Pa. S19	.175

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts
Full Size Body (cut thread)
½ in. and smaller:
6 in. and shorter ..55
Longer than 6 in. ..46.5
⅞ in. thru 1 in.:
6 in. and shorter ..46.5
Longer than 6 in. ..44
1⅛ in. and larger:
All lengths ..44
Undersized Body (rolled thread)
½ in. and smaller:
6 in. and shorter ..55

Carriage, Machine, Lag Bolts
Hot Galvanized:
½ in. and smaller:
6 in. and shorter ..35
Longer than 6 in. ..23
⅞ in. thru 1 in.:
6 in. and shorter ..20
Longer than 6 in. ..20
1⅛ in. and larger:
All lengths ..20

Lag Bolts
All diameters:
6 in. and shorter ..55
Longer than 6 in. ..47

Plow and Tap Bolts
½ in. and smaller by 6 in. and shorter ..54
Larger than ½ in. of longer than 6 in. ..47
Blank Bolts ..47
Step, Elevator, Tire Bolts 54

NUTS

Reg. & Heavy Square Nuts:
All sizes ..59
Square Nuts, Reg. & Heavy, Hot Galvanized:
All sizes ..45
Hex Nuts, Reg. & Heavy, Hot Pressed:
¾ in. and smaller ..63
⅞ in. to 1 in. incl. 59.5
1⅛ in. to 1½ in., incl. ..64
1⅝ in. and larger ..58
Hex Nuts, Reg. & Heavy, Cold Punched:
¾ in. and smaller ..63
⅞ in. to 1½ in., incl. 59.5
1⅝ in. and larger ..58
Hex Nuts, All Types, Hot Galvanized:
¾ in. and smaller ..50
⅞ in. to 1 in., incl. 46
1⅛ in. to 1½ in., incl. ..51
Hex Nuts, Semifinished, Reg. & Heavy (Incl. Slotted):
⅝ in. and smaller ..63
⅞ in. to 1½ in., incl. 59.5
1⅝ in. and larger ..58
Hex Nuts, Finished (Incl. Slotted and Castellated):
1 in. and smaller ..65
1⅛ in. to 1½ in., incl. ..62
1⅝ in. and larger ..58

CAP AND SET SCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread
Bright:
6 in. and shorter:
⅝ in. and smaller .. 47
⅞, 1 in. and 1 in. diam. .. 31
Longer than 6 in.:
⅝ in. and smaller .. 18.5
⅞, 1 in. and 1 in. diam. .. 5.5
High Carbon, Heat Treated:
6 in. and shorter:
⅝ in. and smaller .. 34
⅞, 1 in. and 1 in. diam. .. 13
Longer than 6 in.:
⅝ in. and smaller .. +1
⅞, 1 in. and 1 in. diam. .. +19

Fillister Head, Coarse Thread:
Listed Sizes .. +31
Flat Head, Coarse Thread:
¼ in. and smaller by 6 in. and shorter .. +57
Set Screws, Square Head, Cap Point, Coarse Thread:
Through 1 in. diam.:
6 in. and shorter .. 11
Longer than 6 in. .. +10

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 10.85
1/16-in. under List less 26.5%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13		23.56	22.84
1¼	13		27.92	22.68
1½	13	26.34	30.86	25.08
1¾	13	31.12	36.45	29.64
2	13	34.88	40.88	33.21
2¼	13	39.29	46.01	37.42
2½	12	42.64	49.94	40.61
2½	12	46.98	55.01	44.73
2¾	12	50.86	59.57	48.44
3	12	54.24	63.53	51.66

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	5.075	4.975	5.025	6.00
Ensley,Ala. T2	5.075	4.975	....	6.00
Fairfield,Ala. T2	....	....	....	6.00
Gary,Ind. U5	5.075	4.975	5.025	....
Huntington,W. Va. W7	....	....	....	6.15
IndianaHarbor,Ind. I-2	5.075	4.975	5.025	....
Johnstown,Pa. B2	....	....	...(16)	6.00
Lackawanna,N.Y. B2	5.075	4.975	...(16)	6.00
Minnequa,Colo. C10	5.075	4.975	....	6.50
Steelton,Pa. B2	5.075	4.975	....	....
Williamsport,Pa. S19	....	....	....	6.15

TIE PLATES

Fairfield,Ala. T2	6.025
Gary,Ind. U5	6.025
Ind.Harbor,Ind. I-2	6.025
Lackawanna,N.Y. B2	6.025
Minnequa,Colo. C10	6.025
Seattle B3	6.175
Steelton,Pa. B2	6.025
Torrance,Calif. C11	6.175

JOINT BARS

Bessemer,Pa. U5	6.35
Fairfield,Ala. T2	6.35
Ind.Harbor,Ind. I-2	6.35
Joliet,Ill. U5	6.35
Lackawanna,N.Y. B2	6.35
Minnequa,Colo. C10	6.35
Steelton, Pa. B2	6.35

AXLES

Ind.Harbor,Ind. S13	8.10
Johnstown,Pa. B2	8.10

TRACK BOLTS, Untreated

Cleveland R2	13.10
Lebanon,Pa. B2	13.10
Minnequa,Colo. C10	13.10
Pittsburgh P14	13.10
Seattle B3	13.60

SCREW SPIKES

Cleveland R2	12.85
Pittsburgh P14	12.85

STANDARD TRACK SPIKES

Fairfield,Ala. T2	8.775
Ind.Harbor,Ind. I-2, Y1	8.775
KansasCity,Mo. S5	8.775
Lebanon,Pa. B2	8.775
Minnequa, Colo. C10	8.775
Pittsburgh J5	8.775
Seattle B3	9.275
S.Chicago,Ill. R2	8.775
Struthers,O. Y1	8.775
Youngstown R2	8.775

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in.; 6.25c; 1 15/16 to 8 in., inclusive, 6.60c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 5.685c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝-in.; 7.30c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(48) 6-7 Ga.
(49) 3½-in. and smaller rounds; 8.65c, over 3½-in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.65		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+2	+20	4.5	+14.25	7	+11.75	8.5	+10.25	8.5	+10.25	8.25	+10.5	10.75	+8
Ambridge, Pa. N2	+2	....	4.5	....	7	....	8.5	....	8.5	....	8.25	....	10.75	....
Lorain, O. N3	+2	+20	4.5	+14.25	7	+11.75	8.5	+10.25	8.5	+10.25	8.25	+10.5	10.75	+8
Youngstown Y1	0.5	+17.5	4.5	+14.25	7	+11.75	8.5	+10.25	8.5	+10.25	8.25	+10.5	10.75	+8

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+2	+20	4.5	+14.25	7	+11.75	8.5	+10.25	8.5	+10.25	8.25	+10.5	10.75	+8

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Alton, Ill. L1	....	....	....	....	....	....	10.5	+3.75	13.5	+4.75	16	+1.25	18.5	0.5
Benwood, W. Va. W10	10	+20.5	+0.25	+27.75	+9.75	+37.25	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Butler, Pa. F6	10	+20.5	0.5	+27	+8.5	+36	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Fairless, Pa. N3	....	....	....	....	....	....	10.5	+8.75	13.5	+4.75	16	+1.25	18.5	0.5
Fontana, Calif. K1	....	....	....	....	....	....	0	+19.25	3	+15.25	5.5	+11.75	8	+10
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	11.5	+7.75	14.5	+3.75	17	+0.25	19.5	1.5
Lorain, O. N3	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Sharon, Pa. S4	11	+19.5	1.5	+26	+7.5	+35	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Sparrows Pt., Md. B2	9	+21.5	0.5	+28	+9.5	+37	10.5	+8.75	13.5	+4.75	16	+1.25	18.5	0.5
Wheatland, Pa. W9	11	+19.5	1.5	+26	+7.5	+35	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Youngstown R2, Y1	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5

Size—Inches	1⅛		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	21	3.5	21.5	4	23	4.75	23	4.75	....	....	....	....
Alton, Ill. L1	19	1.5	19.5	2	21	2.75	21	2.75	....	....	....	....
Benwood, W. Va. W10	21	3.5	21.5	4	23	4.75	23	4.75	13.5	+0.75	13.5	+5.25
Etna, Pa. N2	21	3.5	21.5	4	23	4.75	23	4.75	13.5	+5.25	13.5	+5.25
Fairless, Pa. N3	19	1.5	19.5	2	21	2.75	21	2.75	11.5	+7.25	11.5	+7.25
Fontana, Calif. K1	8.5	+9	9	+8.5	10.5	+7.75	10.5	+7.75	1	+17.75	1	+17.75
Indiana Harbor, Ind. Y1	20	2.5	20.5	3	22	3.75	22	3.75	12.5	+6.25	12.5	+6.25
Lorain, O. N3	21	3.5	21.5	4	23	4.75	23	4.75	....	....	....	....
Sharon, Pa. M6	21	3.5	21.5	4	23	4.75	23	4.75	....	....	....	....
Sparrows Pt., Md. B2	19	1.5	19.5	2	21	2.75	21	2.75	11	+7.25	11	+7.25
Wheatland, Pa. W9	21	3.5	21.5	4	23	4.75	23	4.75	13.5	+5.25	13.5	+5.25
Youngstown R2, Y1	21	3.5	21.5	4	23	4.75	23	4.75	13.5	+5.25	13.5	+5.25

*Galvanized pipe discounts based on current price of zinc (13.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	19.75	24.50	....	33.00	....	....	....	45.00	41.50
202	21.00	27.25	33.00	35.75	37.25	39.25	41.25	45.25	45.25
301	20.50	25.25	33.75	34.00	38.25	40.50	42.50	47.25	43.75
302	22.00	28.00	34.00	36.75	38.75	40.75	43.00	47.50	47.50
302B	21.75	28.25	35.25	40.25	38.75	40.75	43.00	50.00	50.00
303	....	28.50	37.00	....	41.50	43.75	45.50	52.00	52.00
304	23.25	29.25	36.00	39.75	40.75	43.00	45.75	50.25	50.25
304L	....	....	43.50	46.75	48.25	50.50	53.25	57.75	57.75
305	24.75	32.50	37.75	43.00	40.75	43.00	46.25	53.50	53.50
308	26.75	34.00	42.50	45.50	48.25	50.50	55.00	57.50	57.50
309	34.75	44.00	51.50	58.50	57.50	60.50	64.25	73.50	73.50
310	42.25	53.75	69.00	75.50	77.50	81.50	83.25	87.00	87.00
314	....	....	....	....	77.50	....	83.25	....	....
316	35.25	44.50	56.25	63.50	63.50	66.75	70.25	74.75	74.75
316L	....	....	63.75	70.00	71.00	74.25	77.75	82.25	82.25
317	43.00	54.50	70.00	81.50	79.50	83.50	86.25	93.25	93.25
321	28.25	35.75	42.25	48.75	48.00	50.25	54.50	60.00	60.00
18-8CbTa	32.75	42.00	50.25	58.25	56.25	59.00	63.75	73.00	73.00
403	....	....	30.75	....	34.50	36.25	38.75	46.50	46.50
405	18.75	24.50	28.50	34.50	32.50	34.00	36.00	45.00	45.00
410	16.00	20.75	27.25	29.75	31.00	32.50	33.75	38.75	38.75
416	....	....	27.75	....	31.50	33.00	34.75	46.50	46.50
420	....	32.25	33.00	40.25	37.75	39.75	43.50	59.50	59.50
430	16.25	21.00	27.75	30.75	31.50	33.00	34.50	39.25	39.25
430F	....	....	28.25	....	32.00	33.50	35.25	49.75	49.75
431	....	27.25	35.50	....	39.75	41.75	43.50	53.00	53.00
446	....	....	37.75	56.75	42.50	44.75	46.00	67.25	67.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Div., H. K. Porter Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U.S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.;Eastern Stainless Steel Corp.; Elwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McInnes Steel Co.; McLouth Steel Corp.; Metal Forming Corp.; National-Standard Co.; National Tube Div., U.S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates—Carbon Base 5%	10%	15%	20%	Sheets—Carbon Base 20%
Stainless					
302	....	....	....	....	33.25
304	....	34.50	....	41.50	35.25
304-L	....	37.20	....	44.65	....
316	....	38.70	....	46.65	52.25
316-L	....	45.70	....	54.35	....
316-CB	....	45.90	....	54.75	....
321	....	36.35	....	43.40	42.00
347	....	39.50	....	48.45	51.00
405	....	29.20	....	37.05	....
410	....	28.70	....	36.55	....
430	....	28.70	....	36.55	....
Inconel	45.70	54.80	63.85	73.00	....
Nickel	37.95	46.25	54.60	62.95	....
Nickel, Low Carbon	38.25	46.90	55.60	64.40	....
Monel	40.30	49.10	57.95	66.80	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	34.40	40.65

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.290	Cr Hot Work	0.45-0.495
Extra Carbon	0.345	W-Cr Hot Work	0.043-0.475
Special Carbon	0.41-0.45	V-Cr Hot Work	0.460
Oil Hardening	0.450	Hi-Carbon-Cr	0.830

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	4.170
18.25	4.25	1	4.75	....	2.385
18	4	2	9	....	2.7575
18	4	2	....	....	1.845
18	4	1	....	....	1.680
9	3.5	..	....	....	1.275
13.5	4	3	....	....	1.945
13.75	3.75	2	5	....	2.325
6.4	4.5	1.9	....	5	1.185
6	4	3	....	6	1.430
1.5	4	1	....	8.5	1.040

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

Birmingham District	Basic	No. 2 Foundry	Malle-able	Besse-mer
AlabamaCity,Ala. R2	58.50	59.00	....	....
Birmingham R2	58.50	59.00‡	....	....
Birmingham U6	....	59.00‡	63.00	....
Woodward,Ala. W15	58.50	59.00‡	63.00	....
Cincinnati, deld.	....	66.70	....	....
Buffalo District				
Buffalo H1, R2	62.50	63.00	63.50	64.00
Tonawanda,N.Y. W12	62.50	63.00	63.50	64.00
N.Tonawanda,N.Y. T9	....	63.00	63.50	64.00
Boston, deld.	73.79	74.29	74.79	....
Rochester,N.Y., deld.	65.52	66.02	66.52	....
Syracuse,N.Y., deld.	66.62	67.12	67.62	....
Chicago District				
Chicago I-3	62.50	63.00	63.00	63.50
Gary,Ind. U5	62.50	....	63.00	....
S.Chicago,Ill. R2	62.50	....	63.00	....
S.Chicago,Ill. Y1	62.50	63.00	63.00	....
S.Chicago,Ill. U5	62.50	....	63.00	63.50
S.Chicago,Ill. W14	62.50	....	63.00	63.50
Milwaukee, deld.	64.80	65.30	65.30	65.80
Muskegon,Mich., deld.	....	69.68	69.68‡	....
Cleveland District				
Cleveland R2, A7	62.50	63.00	63.00	63.50
Akron,O., deld.	65.25	65.75	65.75	66.25
Mid-Atlantic District				
Bethlehem,Pa. B2	64.50	65.00	65.50	66.00
NewYork, deld.	....	69.01	69.51	....
Newark,N.J., deld.	67.70	68.20	68.70	69.20
Birdsboro,Pa. B10	64.50	65.00	65.50	66.00
Chester,Pa. P4	64.50	65.00	65.50	....
Philadelphia, deld.	66.26	66.76	67.26	....
Steelton,Pa. B2	64.50	65.00	65.50	66.00
Swedeland,Pa. A3	64.50	65.00	65.50	66.00
Philadelphia, deld.	66.26	66.76	67.26	67.76
Troy,N.Y. R2	64.50	65.00	65.50	66.00
Pittsburgh District				
NevilleIsland,Pa. P6	62.50	63.00	63.00	63.50
Pittsburgh (N&S sides), Aliquippa, deld.	....	64.45	64.45	64.98
McKeesRocks,Pa. deld.	....	64.10	64.10	64.63
Lawrenceville, Homestead, Wilmerding, Monaca,Pa., deld.	....	64.76	64.76	65.29
Verona, Trafford,Pa., deld	64.79	65.32	65.32	65.85
Brackenridge,Pa., deld.	65.10	65.60	65.60	66.13
Bessemer,Pa. U5	62.50	....	63.00	63.50
Clairton,Rankin,S.Duquesne,Pa. U5	62.50	....	....	....
Midland Pa. C18	62.50	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malle-able	Besse-mer
Hubbard,O. Y1	....	....	63.00	....
Sharpsville,Pa. S6	62.50	....	63.00	63.50
Youngstown Y1	....	....	63.00	63.50
Mansfield,O., deld.	67.40	....	67.90	68.40
Duluth I-3	62.50	63.00	63.00	63.50
Erie,Pa. I-3	62.50	63.00	63.00	63.50
Everett,Mass. E1	63.25	63.75	64.25	....
Fontana,Calif. K1	70.00	70.50	....	....
Geneva,Utah C11	62.50	63.00	....	....
GraniteCity,Ill. G4	64.40	64.90	65.40	....
Ironton,Utah C11	62.50	63.00	....	....
LoneStar,Tex. L6	58.50*	59.00†	....	....
Minnequa,Colo. C10	64.50	65.00	65.50	....
Rockwood,Tenn. T3	....	59.00‡	63.00	....
Toledo,O. I-3	62.50	63.00	63.00	63.50
Cincinnati, deld.	68.26	68.76	....	....

*Phos. 0.51-0.75%; Phos. 0.31-0.50%, $59.50.
†Phos. 0.51-0.75%; Phos. 0.31-0.50%, $60.
‡Phos. 0.70-0.90%; intermediate (Phos. 0.31-0.69%), $60.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.05% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%; add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.25 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. I-3, J1	71.50
Buffalo H1	72.75

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$97.50
NiagaraFalls,N.Y. P15	97.50
Keokuk,Iowa, Open-hearth & Fdry, freight allowed K2	102.00
Keokuk, O.H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	105.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$76.50
Rockwood,Tenn. T3 (Phos. 0.035% max)	76.50
Steelton,Pa. B2 (Phos. 0.035% max)	70.50
Philadelphia, deld.	74.05
Troy,N.Y. R2 (Phos. 0.035% max)	70.50
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	67.50
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	67.50
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	67.50
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	67.50

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: St. Paul, 25 cents; Moline, Norfolk, Richmond, Washington, 20 cent; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, San Francisco, Spokane, 10 cents; Atlanta, Houston, Seattle no charge.

	SHEETS				STRIP	BARS				Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Mer-chant Qual.	H.R. Spec. Qual.	C.F. Rds.‡	H.R. Alloy 4140††		Carbon	Floor
Atlanta	8.07§	9.27§	9.83§	....	8.16	8.30	....	10.14	....	8.44	8.40	10.22
Baltimore	7.79	8.99	9.12	....	8.27	8.34	8.87	9.09¹⁰	15.69	8.57	8.12	10.81
Birmingham	7.68§	8.88§	8.85§	....	7.78	7.91	8.44	10.04	....	8.05	8.01	10.04
Boston	8.70	9.73	11.02	....	8.79	8.88	9.43	10.71	14.46	8.90	8.98	10.39
Buffalo	7.75	8.90	10.72	....	8.00	8.00	8.70	8.70	14.30	8.25	8.25	9.80
Chattanooga	7.90§	9.10§	9.10§	....	8.00	8.13	8.66	9.96	....	8.27	8.23	9.98
Chicago	7.70	8.90	9.70	....	7.78	7.91	8.44	8.35	13.95	8.05	8.01	9.26
Cincinnati	7.82	8.89	9.75	....	8.06	8.19	8.72	8.82	14.23	8.55	8.34	9.53
Cleveland	7.68	8.88	9.60	....	7.88	7.99	8.52	8.60	14.03	8.38	8.21	9.46
Denver	9.55	11.09	12.41	....	9.70	9.75	....	10.54	18.89	9.60	9.50	11.15
Detroit	7.91	9.13	10.02	....	8.10	8.18	8.71	8.68	14.19	8.55	8.33	9.49
Erie, Pa.	7.75	8.88	9.60¹⁰	....	7.90	8.00	8.65	8.70¹⁰	....	8.35	8.20	9.50
Houston	8.70	9.65	10.99	....	8.80	8.95	9.50	10.55	15.00	8.90	8.60	10.10
Jackson, Miss.	8.00§	9.20§	9.22§	....	8.10	8.23	8.76	10.14	....	8.37	8.33	10.08
Los Angeles	8.90	10.65	11.65	....	9.10	8.80	9.50	11.70	15.25	8.95	9.35	11.50
Milwaukee	7.82	9.02	9.82	....	7.90	8.03	8.56	8.57	14.07	8.24	8.13	9.38
Moline, Ill.	8.05	9.25	10.05	....	8.13	8.26	....	8.70	....	7.78	8.36	....
New York	8.35	9.53	10.23	57.73	8.81	8.83	9.38	10.61	14.37	8.74	8.78	10.05
Norfolk, Va.	7.85	....	....	....	8.30	8.35	....	10.80	....	8.60	8.10	9.60
Philadelphia	7.89	9.08	10.12	....	8.58	8.37	8.90	9.12	14.15	8.38	8.28	9.37
Pittsburgh	7.68	8.88	10.05	50.00	7.88	7.91	8.44	8.60	13.95	8.05	8.01	9.26
Portland, Oreg.	8.90	9.65	11.40	....	9.05	8.95	....	13.55	14.60	8.90	8.70	11.60
Richmond, Va.	8.05	....	10.09	....	8.45	8.70	9.20	10.00	....	8.80	8.35	9.70
St. Louis	8.02	9.21	10.03	....	8.11	8.25	8.78	8.93	14.28	8.48	8.34	9.59
St. Paul	8.29	9.49	10.31	....	8.39	8.52	....	9.21	....	8.75	8.71	9.87
San Francisco	8.75	10.30	10.80	....	8.95	8.80	9.35	12.30	15.25	8.85	8.85	11.15
Seattle	9.35	10.45	11.55	....	9.50	9.30	9.85	13.15	15.55	9.15	9.05	11.25
Spokane, Wash.	9.35	10.50	11.55	....	9.50	9.30	9.85	13.15	16.30	9.15	9.05	11.25
Washington	8.37	10.57	....	....	9.06	8.92	....	9.67	....	9.15	8.70	10.14

*Prices do not include gage extras; †prices include gage and coating extras (based on 12.50c zinc at Los Angeles and 13.50c at other points), except in Birmingham (coating extra excluded); ‡includes 35-cent bar quality extras; **⅝-in. and heavier, ††as annealed; §42 in. and under.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York and Boston, 10 000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; ⁸—400 to 999 lb; ⁹—1000 to 1999 lb; ¹⁰—2000 to 3999 lb; ¹⁹—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $128; Salina, Pa., $133; Niles, O., $138; Cutler, Utah, $148.

Super-Duty: Ironton, O., Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St. Louis, $165; Stevens Pottery, Ga., $175.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, O., Hawstone, Pa., $140; Warren, Niles, Windham, O., Hays, Latrobe, Morrisville, Pa., $145; E. Chicago, Ind., Joliet, Rockdale, Ill., $150; Lehigh, Utah, $165; Los Angeles, $170.

Super-Duty: Hays, Sproul, Hawstone, Pa., Niles, Warren, Windham, O., Leslie, Md., Athens, Tex., $157; Morrisville, Latrobe, Pa., $160; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $145; Woodbridge, N. J., $128; Philadelphia, $130.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, O., $96; Clearfield, Pa., Portsmouth, O., $98.

High-Alumina Brick (per 1000)

50 Per Cent: St. Louis, Mexico, Vandalia, Mo., $220; Danville, Ill., $223; Philadelphia, Clearfield, Pa., $230.

60 Per Cent: St. Louis, Mexico, Vandalia, Mo., $275; Danville, Ill., $278; Philadelphia, Clearfield, Pa., $285.

70 Per Cent: St. Louis, Mexico, Vandalia, Mo., $315; Danville, Ill., $318; Philadelphia, Clearfield, Pa., $325.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $177; Clearfield, Pa., $189.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $292; Clearfield, Pa., $311.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $221; Clearfield, Pa., $236.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billimeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Narlo, O., $16; Thornton, McCook, Ill., $16.35; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ⅛-in. grains with fines: Chewelah, Wash., Luning, Nev. $43; ⅜-in. grains with fines: Baltimore, $69.40.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $38-39; 70%, $35-36; 60%, $31-32. Imported, net tons, f.o.b. cars point of entry duty paid, metallurgical grade: European, $34; Mexican, $26.50.

Ores

Lake Superior Iron Ore

(Prices effective for the 1956 shipping season, gross tons, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$11.25
Old range nonbessemer	11.10
Mesabi bessemer	11.00
Mesabi nonbessemer	10.85
Open-hearth lump	12.10
High phos.	10.85

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Dec. 1, 1955, and increases or decreases after such date are for seller's account.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	25.00
N. African hematite (spot)	nom. 24.00-25.00
Brazilian iron ore, 68-69%	33.00-34.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$28.50-29.00
Domestic, concentrates, mine	55.00

Manganese Ore

Mn 46-48%, Indian (export tax included), $1.60-1.70 per long ton unit, c.i.f. U.S. ports, duty for buyer's account; other than Indian, $1.45-1.50; contracts by negotiation.

Chrome Ore

Gross ton f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$54.00-57.00
48% 2.8:1	51.00-54.00
48% no ratio	43.00-45.00

South African Transvaal

48% no ratio	$37.50-39.00
44% no ratio	26.00-27.00

Turkish

48% 3:1	$60.00-63.00

Domestic

Rail nearest seller

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.18

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

55-60%	$3.35-3.80
60-65%	3.80-3.90

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge iron:	
Swedish, c.i.f. Camden, N.J., c.l. in bags	8.50
Domestic:	
F.o.b. Johnstown, Pa., Niagara Falls, N. Y., in bags	9.50
F.o.b. Riverton, N.J., in bags	8.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	26.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	34.00
Unannealed (99+% Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)	29.00
Carbonyl Iron:	
98.1-99.9%, 3 to 20 microns, depending on grade, 86.00-275.00, in standard 200-lb containers; all minus 200 mesh.	
Aluminum:	
Atomized, 500 lb. drum, frght allowed	
Carlots	36.20
Ton lots	38.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	36.80-46.80†
Bronze, 5000-lb lots	56.20-60.00†
Copper:	
Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese:	
Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.00
Nickel-Silver, 5000-lb lots	55.10-58.40†
Phosphor-Copper, 5000-lb lots	66.00
Copper (atomized) 5000-lb lots	48.50-56.00‡
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.05
Stainless Steel, 316	$1.40
Tin	14.50*
Zinc, 5000-lb lots	19.75-33.00‡
Tungsten:	Dollars
Melting grade, 99%	
60 to 200 mesh:	
1000 lb and over	4.20
Less than 1000 lb	4.35
Chromium, electrolytic 99.8% Cr min. metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni. **64% Cu, 18% Zn, 18% Ni.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Diam. (inches)	Length (inches)	Per 100 lb
2	24	$57.75
2½	30	37.25
3	40	35.25
4	40	33.25
5⅛	40	33.00
6	60	30.00
7	60	26.75
8, 9, 10	60	26.50
12	72	25.50
14	60	25.50
16	72	24.50
17	60	25.50
18	72	24.50
20	72	24.00
24	84	24.75

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-15.50
Connellsville, foundry	17.50-18.50

Oven Foundry Coke

Birmingham, ovens	$27.60
Cincinnati, deld.	32.53
Buffalo, ovens	29.50
Camden, N.J., ovens	28.50
Detroit, ovens	29.50
Pontiac, deld.	31.15
Saginaw, deld.	32.73
Erie, Pa. ovens	29.50
Everett, Mass., ovens	
New England, deld.	30.55*
Indianapolis, ovens	28.75
Ironton, O., ovens	28.00
Cincinnati, deld.	28.25
Kearny, N.J., ovens	28.75
Lone Star, Tex., ovens	25.50
Milwaukee, ovens	29.50
Painesville, O., ovens	29.50
Cleveland, deld.	31.55
Philadelphia, ovens	28.50
St. Louis, ovens	28.50
Neville Island (Pittsburgh), Pa., ovens	28.25
St. Paul, ovens	28.50
Chicago, deld.	31.82
Swedeland, Pa., ovens	28.50
Terre Haute, Ind., ovens	28.75

*Or within $4.55 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$7.40	$7.40	$7.40	$7.65
Bar Size Angles	7.11	7.11	7.11	7.26
Structural Angles	7.10	7.40	7.40	7.70
I-Beams	7.75	7.75	7.75	8.15
Plates	9.50	9.50	9.50	10.00
Sheets, H.R.	8.55	8.55	8.55	8.85
Sheets, C.R. (drawing quality)	8.95	8.95	8.95	9.35
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	27.02	27.02	27.02	27.49
Barbed Wire (†)	6.61	6.61	6.61	6.96
Merchant Bars	7.15	7.15	7.15	7.50
Hot-Rolled Bands	7.25	7.25	7.25	7.65
Wire Rods, Thomas Commercial No. 5	6.38	6.38	6.38	6.78
Wire Rods, O-H Cold Heading Quality No. 5	6.72	6.72	6.72	7.12
Bright Common Wire Nails (‡)	7.90	7.90	7.90	8.02
Oil Country Pipe: Mills withdrawn for remainder of the year.				

†Per 82-lb. net, reel. ‡Per 100-lb kegs, 20d nails and heavier.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00
Per ton, bulk, ovens	
Ammonium sulfate	$32.00
Cents per pound, producing point	
Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.	

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Pa. 21-23% Mn, $102; 19-21% Mn, 1-3% Si, $99.50; 16-19% Mn, $97.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $235, Johnstown, Duquesne, Sheridan, Pa.; $255, Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%). Lump $223 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min Fe 2% max, Si 1% max, C 0.2% max). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 33c; 2000 lb to min carload, 35c; 500 lb to 1999 lb, 37c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 13.8c per lb of alloy. Packed, c.l. 15c, ton 15.45c, less ton 16.45c, f.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37 f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump bulk 27.75c per lb of contained Cr; c.l. packed 29.3c, ton lot 31.05c; less ton 32.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 34.75c per lb contained Cr, 0.02% max 41.5c, 0.03% max 41c, 0.06% max 39.5c, 0.1% max 39c, 0.15% max 38.75c, 0.2% max 38.5c, 0.5% max 38.25c, 1.0% max 37.5c 1.5% max 37.35c, 2.0% max 37.25c. Ton lot, add 3.4c, less ton add 5.1c. Carload packed add 1.75c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 29.05c per lb contained Cr. Packed, c.l. 30.65c, ton 32.45c, less ton 33.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 20.85c, per lb of alloy, ton lot 22.10c; less ton lot 23.3c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 39-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk 41.35c per lb of contained Cr; 1" x down, bulk 42.35c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ⅛" thick) $1.29 per lb, ton lots $1.31, less ton lots $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity. $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1, $1.05 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 13.9c per lb of contained Si. Packed c.l. 16.4c, ton lot 17.85c, less ton 19.5c, f.o.b. Alloy, W. Va., Ashtabula, Marietta, O., Sheffield, Ala., and Portland, Oreg. Spot, add 0.45c.

Low Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.55c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per pound contained silicon. Packed, c.l. 17.25c, ton lot, 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 98% Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 2% Fe grade analyzing min 96.5% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy, ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5%-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3% lb each and containing 2 lb of Cr). Contract, carload, bulk, 19c per lb of briquet, carload packed in box pallets 19.2c, in bags 20.1c; 3000 lb to c.l. in box pallets 20.4c; 2000 lb to c.l. in bags, 21.3c; less than 2000 lb in bags 22.2c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet, c.l. packed pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l. bags, 17.2c, less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet, c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing 2 lb of Si). Contract, carload, bulk, 7.7c per lb of briquet, packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l. bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c. (Small size—weighing approx. 2½ lb and containing 1 lb of Si). Carload, bulk 7.8c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l. pallets 9.65c; 2000 lb to c.l. bags 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.41 per pound of Mo contained f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.15 per lb of contained W; 2000 lb W to 5000 lb W, $3.25; less than 2000 lb W, $3.37 Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $6.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $4.95 per lb of contained Cb plus Ta, delivered; less ton lots $5.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, c.l. packed ½-in. x 12 M 19c per lb of alloy, ton lots 20.15c, less ton 21.4c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lots 20.15c; less ton lots 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lots 19.55c; less ton lots 20.8c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb contained Mo in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.

Scrap Prices Are Marking Time

Composite on steelmaking grades leveling out around $64.83 on limited mill buying. Lull expected to continue over the holiday period, but market undertone is strong

Scrap Prices, Page 98

Philadelphia—Steel scrap prices have been leveling off, and trading is likely to be spotty over the holidays. No. 2 bundles are a shade easier at $52-$54, delivered, and short shoveling turnings at $48-$49. The major open-hearth grades are unchanged at $63, delivered. Couplers, springs and wheels are higher at $74.

No. 1 cupola cast and drop-broken machinery are higher on recent purchases by the Fairless Works. Cupola cast is holding at $52-$56, delivered, although there is some question as to how much longer the inside figure can be done. The leading pipe mills have been getting this grade at $52, but most of the tonnage ordered against this price has been shipped. Prices on drop-broken machinery are $60-$61, delivered.

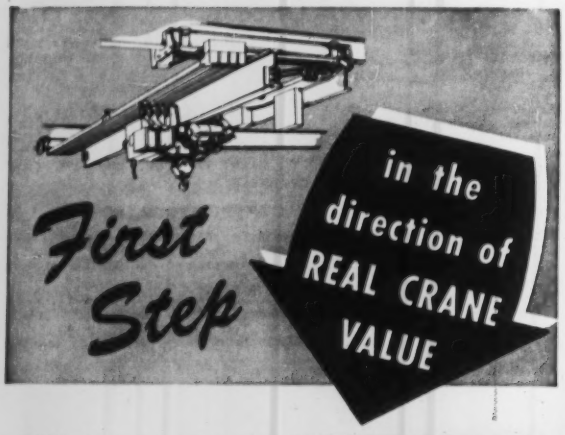
New York — Brokers have advanced buying prices on No. 1 heavy melting and No. 1 bundles to $58; machine shop turnings went to $36-$37. Short shoveling turnings are slightly easier at $41-$41.50. Brokers are offering $1 more for unstripped motor blocks, quoting $38-$39, and $2 more for heavy breakable cast, quoting $50-$51.

Bethlehem Steel Co. recently purchased the 32,000-ton battleship, the *U.S.S. Mississippi*, for scrap. The vessel, commissioned in 1917, brought $1,660,764 as scrap. The ship was retired from active service last July. In her last years, she was used as an experimental gunnery ship.

Watertown Arsenal takes bids Dec 27 on an estimated 200 tons of machine shop turnings, to be accumulated between Dec. 31 and Mar. 29.

Pittsburgh—Prices are holding on all the principal grades of scrap in the absence of new mill buying. Some observers think the market has reached its peak, but brokers say the present lull in buying is explained by the mills' desire to hold down year-end inventories and the usual seasonal slackening over the holidays. The cast grades are in slower demand, and prices are off about $2 a ton.

Chicago—The scrap market here awaits a test following the price break which came more than a week ago. So far, consumers have not sought such a test, and, as



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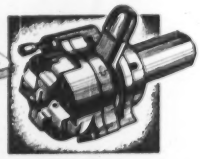

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was hinted earlier, they may ride out the year without attempting to buy melting material. It is known that inventories are substantial at the prevailing 102.5 per cent district steel ingot operating rate. Receipts on old contracts during the last two weeks have been substantial.

The market continues soft but does not seem to be losing ground. Some observers believe that the market is stronger than the recent selloff of $2 to $6 a ton indicated; they doubt that those buying prices can be duplicated today.

Cleveland—Not much in the way of buying is anticipated in the scrap market over the holiday season. Prices are holding at levels established several weeks ago. High steelmaking operations continue to provide strong support. Auto lists at the end of this month will influence the general price trend in early January.

Buffalo—Scrap trading quieted down last week as year-end influences began to be felt. Prices are steady, and the market undertone is firm despite reports of easiness at other consuming points. Some local dealers think the market may soften a bit after Jan. 1.

Scrap is moving freely against outstanding orders, but supplies are limited.

Youngstown — Some higher prices for scrap have appeared here. One consumer bought No. 2 heavy melting at $59, up $1, and No. 2 bundles at $52, up $5. Another mill bought No. 1 heavy melting at $66-$68, and bundles at $65-$67, up $1 to $2.

Detroit—Prices are unchanged. Brokers are still talking of a bearish market, but they are still paying high prices for No. 1 heavy melting grade. Some of this strength is due to late Canadian orders. Punchings and plate orders are at a minimum. There is practically no movement in this area. Foundries are balking at paying $70-$72 for high grade punchings and plates.

Cincinnati — Scrap prices are marking time at the highest levels in history—$62-$63 for No. 1 heavy melting. No new substantial purchases were made last week to alter the price picture. Brokers think that January may bring a reversal of the upward climb.

Birmingham — Export prices at most southern ports are strong. With the mills finding sufficient scrap locally to satisfy present needs, exporters are reaching farther inland as they build inventories for boats scheduled for departure before the court ban on a strike by the longshoremen expires.

The larger steel mills in the area remain out of the market. Electric furnaces apparently have fair inventories, though they are making some purchases.

Some specialty items advanced last week, and the most recent railroad lists reflect strength. The cast market continues firm.

St. Louis—Scrap prices declined slightly here last week. No. 2 heavy melting and rails, 18 in. and under, dropped $1. Random length rails fell $3 a ton.

Los Angeles—Prices fell slightly in a year-end adjustment. No. 1 heavy melting declined $1 to $54, as did No. 2 heavy melting to $52. No. 1 bundles also fell $1 to $53, and No. 2 bundles dropped $7 to $40. Machine shop turnings reversed the recent downtrend, rising $3 to $35. No. 1 cupola cast continues erratic, with quotations ranging from $55 to $59.

Seattle — The scrap market is firm, with No. 1 and No. 2 heavy melting steel quoted at $54 and $51. Export interests are buying heavily, and local consumption is above normal. Supplies are said to be ample. Turnover is active. Dealers expect current market conditions to extend into the first quarter.

San Francisco — Steel scrap prices are unchanged here. The market is quiet, but consumption continues at high level. One large steelmaker is operating well above its capacity rating.

Washington — Consumption of ferrous materials (scrap and pig iron) set an all-time high in October, reports the Bureau of Mines. The total was 8 per cent above the September mark and slightly better than that of the previous record month, March, 1956.

The total melt (13,163,000 gross tons) consisted of 51 per cent scrap and 49 per cent pig iron. This compared with 50.7 per cent and 49.3 in September. Scrap consumed amounted to 6,714,000 tons, 8 per cent above the preceding month; pig iron consumption was 6,449,000 tons, up 7 per cent.

Of total scrap consumption during October, home scrap accounted for 3,714,000 tons, purchased scrap, 3,123,000 tons. Of the purchased material, 87 per cent was received from dealers, and 13 per cent from other sources.

Stocks of ferrous scrap held by consumers at the end of October totaled 6,183,000 tons. This is an increase of 2 per cent over the previous month. At 2,127,000 tons, stocks of pig iron were slightly below those of the preceding month.

Iron Ore . . .

Iron Ore Prices, Page 94

Lake Superior iron ore shipments totaled 396,296 gross tons in the week ended Dec. 17. This was the largest weekly tonnage ever re-

(*Please turn to page* 103)

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Dec. 19	$64.83
Dec. 12	65.50
Nov. Avg.	61.83
Dec. 1955	50.37
Dec. 1951	43.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	66.00-67.00
No. 2 heavy melting	58.00-59.00
No. 1 bundles	66.00-67.00
No. 2 bundles	53.00-54.00
No. 1 busheling	66.00-67.00
Machine shop turnings	44.00-45.00
Mixed borings, turnings	44.00-45.00
Short shovel turnings	48.00-49.00
Cast iron borings	48.00-49.00
Cut structurals, 3 ft. lengths	73.00-74.00
Heavy turnings	59.00-60.00
Punchings & plate scrap	73.00-74.00
Electric furnace bundles	73.00-74.00

Cast Iron Grades

No. 1 cupola	*54.00-55.00*
Heavy breakable cast	*52.00-53.00*
Unstripped motor blocks	*40.00-41.00*
No. 1 machinery cast	*61.00-62.00*

Railroad Scrap

No. 1 R.R. heavy melt.	71.00-72.00
Rails, 2 ft and under	81.00-82.00
Rails, 18 in. and under	82.00-83.00
Rails, random lengths	79.00-80.00
Railroad specialties	75.00-76.00

Stainless Steel Scrap

18-8 bundles & solids	480.00-520.00
18-8 turnings	400.00-420.00
430 bundles & solids	110.00-120.00
430 turnings	80.00-85.00

CLEVELAND

No. 1 heavy melting	64.50-65.50
No. 2 heavy melting	50.00-51.00
No. 1 bundles	64.50-65.50
No. 2 bundles	44.00-45.00
No. 1 busheling	64.50-65.50
Machine shop turnings	35.00-36.00
Mixed borings, turnings	38.00-39.00
Short shovel turnings	38.00-39.00
Cast iron borings	38.00-39.00
Cut foundry steel	62.00-63.00
Low phos.	65.50-66.50
Cut structural plates 2 ft and under	71.00-72.00
Alloy free, short shovel turnings	43.00-44.00
Electric furnace bundles	65.50-66.50

Cast Iron Grades

No. 1 cupola	59.00-60.00
Charging box cast	52.00-53.00
Heavy breakable cast	50.00-51.00
Stove plate	55.00-56.00
Unstripped motor blocks	39.00-40.00
Brake shoes	47.00-48.00
Clean auto cast	57.00-58.00
Burnt cast	44.00-45.00
Drop broken machinery	60.00-61.00

Railroad Scrap

No. 1 R.R. heavy melt.	68.00-69.00
R.R. malleable	71.00-72.00
Rails, 2 ft and under	86.00-87.00
Rails, 18 in. and under	87.00-88.00
Rails, random lengths	83.00-84.00
Cast steel	71.00-72.00
Railroad specialties	77.00-78.00
Uncut tires	76.00-77.00
Angles, splice bars	78.00-79.00
Rails, rerolling	85.00-86.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	450.00-500.00
18-8 turnings	300.00-310.00
430 clips, bundles, solids	115.00-120.00
430 turnings	55.00-65.00

YOUNGSTOWN

No. 1 heavy melting	66.00-67.00
No. 2 heavy melting	57.00-58.00
No. 1 bundles	66.00-67.00
No. 2 bundles	49.00-50.00
No. 1 busheling	66.00-67.00
Machine shop turnings	36.00-37.00
Short shovel turnings	43.00-44.00
Cast iron borings	43.00-44.00
Low phos.	68.50-69.50
Electric furnace bundles	68.50-69.50

Railroad Scrap

No. 1 R.R. heavy melt.	69.00-70.00

CHICAGO

No. 1 heavy melting	*64.00-66.00*
No. 2 heavy melting	*51.00-52.00*
No. 1 factory bundles	*67.00-69.00*
No. 1 dealer bundles	*62.00-63.00*
No. 2 bundles	*48.00-49.00*
No. 1 busheling	*64.00-66.00*
Machine shop turnings	*39.00-40.00*
Mixed borings, turnings	*41.00-42.00*
Short shovel turnings	*41.00-42.00*
Cast iron borings	*41.00-42.00*
Cut structurals, 3 ft	71.00-72.00
Punchings & plate scrap	72.00-73.00

Cast Iron Grades

No. 1 cupola	50.00-51.00
Stove plate	46.00-47.00
Unstripped motor blocks	39.00-40.00
Clean auto cast	55.00-56.00
Drop broken machinery	55.00-56.00

Railroad Scrap

No .1 R.R. heavy melt.	69.00-70.00
R.R. malleable	70.00-71.00
Rails, 2 ft and under	*87.00-88.00*
Rails, 18 in. and under	*88.00-89.00*
Angles, splice bars	*78.00-79.00*
Rails, rerolling	*89.00-90.00*

Stainless Steel Scrap

18-8 bundles & solids	505.00-515.00
18-8 turnings	355.00-375.00
430 bundles & solids	105.00-110.00
430 turnings	60.00-65.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	59.00
No. 2 heavy melting	49.00
No. 1 bundles	60.00
No. 2 bundles	40.00
No. 1 busheling	59.00
Machine shop turnings	31.00
Mixed borings, turnings	33.00
Short shovel turnings	34.00
Punchings & plate scrap	64.00-65.00

Cast Iron Grades

No. 1 cupola	49.00
Charging box cast	43.00
Stove plate	45.00
Heavy breakable	44.00
Unstripped motor blocks	32.00
Clean auto cast	54.00
Malleable	54.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	58.00
No. 2 heavy melting	*47.50*
No. 1 bundles	58.00
No. 2 bundles	44.00
No. 1 busheling	58.00
Machine shop turnings	36.00
Short shovel turnings	38.50

Cast Iron Grades

No. 1 cupola	51.00
Charging box cast	46.50
Heavy breakable cast	46.50
Unstripped motor blocks	45.50
Brake shoes	51.00
Clean auto cast	53.00
Stove plate	*44.00*

Railroad Scrap

No. 1 R.R. heavy melt	66.50
Rails, 18 in. and under	*85.00*
Rails, rerolling	90.00
Rails, random lengths	*82.00*
Angles, splice bars	72.00

PHILADELPHIA

No. 1 heavy melting	63.00
No. 2 heavy melting	55.00-56.00
No. 1 bundles	63.00
No. 2 bundles	*52.00-54.00*
No. 1 busheling	63.00
Electric furnace bundles	65.00-66.00
Mixed borings, turnings	45.00-46.00
Machine shop turnings	45.00-46.00
Short shovel turnings	*48.00-49.00*
Heavy turnings	58.00-59.00
Structurals & plates	68.00-70.00
Couplers, springs, wheels	*74.00*
Rails, crops, 2 ft & under	82.00-83.00

Cast Iron Grades

No. 1 cupola	*52.00-56.00*
Malleable	68.00
Heavy breakable cast	59.00
Drop broken machinery	*60.00-61.00*

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*58.00*
No. 2 heavy melting	48.00-49.00
No. 1 bundles	*58.00*
No. 2 bundles	46.00-47.00
Machine shop turnings	*36.00-37.00*
Mixed borings, turnings	35.00-36.00
Short shovel turnings	*41.00-41.50*
Low phos. (structural & plate)	59.00-60.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Unstripped motor blocks	*38.00-39.00*
Heavy breakable	*50.00-51.00*

Stainless Steel

18-8 heets, clips, solids	475.00-485.00
18-8 borings, turnings	335.00-360.00
430 sheets, clips, solids	110.00-115.00
410 sheets, clips, solids	100.00-105.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	53.00-54.00
No. 2 heavy melting	43.00-44.00
No. 1 bundles	54.00-55.00
No. 2 bundles	40.50-41.50
No. 1 busheling	54.00-55.00
Machine shop turnings	33.00-34.00
Mixed borings, turnings	34.50-35.00
Short shovel turnings	37.00-38.00
No. 1 cast	45.50-46.50
Mixed cupola cast	43.00-44.00
No. 1 machinery cast	46.00-47.00

BUFFALO

No. 1 heavy melting	62.00-63.00
No. 2 heavy melting	52.00-53.00
No. 1 bundles	62.00-63.00
No. 2 bundles	48.00-49.00
No. 1 busheling	62.00-63.00
Mixed borings, turnings	38.00-39.00
Machine shop turnings	39.00-40.00
Short shovel turnings	43.00-44.00
Cast iron borings	34.00-35.00
Low phos.	65.00-66.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	49.00-50.00
No. 1 machinery	54.00-55.00

Railroad Scrap

Rails, random lengths	71.00-72.00
Rails, 3 ft and under	77.00-78.00
Railroad specialties	70.00-71.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	62.00-63.00
No. 2 heavy melting	52.00-53.00
No. 1 bundles	62.00-63.00
No. 2 bundles	46.00-47.00
No. 1 busheling	62.00-63.00
Machine shop turnings	41.50-42.50
Mixed borings, turnings	39.50-40.50
Short shovel turnings	43.50-44.50
Cast iron borings	39.50-40.50
Low phos. 18 in.	68.00-69.00

Cast Iron Grades

No. 1 cupola	48.00-49.00
Heavy breakable cast	47.00-48.00
Charging box cast	48.00-49.00
Drop broken machinery	59.00-60.00

Railroad Scrap

No. 1 R.R. heavy melt.	64.00-65.00
Rails, 18 in. and under	82.00-83.00
Rails, random lengths	74.00-75.00

BIRMINGHAM

No. 1 heavy melting	46.00-47.00
No. 2 heavy melting	44.00-45.00
No. 1 bundles	46.00-47.00
No. 2 bundles	38.00-39.00
No. 1 busheling	46.00-47.00
Cast iron borings	27.00-28.00
Short shovel turnings	*40.00-41.00*
Machine shop turnings	*39.00-40.00*
Bar crops and plate	*64.00-65.00*
Structurals & plate, 2 ft.	*63.00-64.00*
Electric furnace bundles	56.00-57.00
Cut foundry steel	54.00-55.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	52.00-53.00
Stove plate	51.00-52.00
Unstripped motor blocks	44.00-45.00
Charging box cast	40.00-41.00
No. 1 wheels	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	63.00-64.00
Rails, 18-in. and under	76.00-77.00
Rails, rerolling	82.00-83.00
Rails, random lengths	*76.00-77.00*
Angles, splice bars	68.00-69.00

SEATTLE

No. 1 heavy melting	54.00
No. 2 heavy melting	51.00
No. 1 bundles	51.00
No. 2 bundles	31.00
Machine shop turnings	28.00-30.00
Mixed borings, turnings	28.00-30.00
Electric furnace No. 1	62.00-65.00

Cast Iron Grades

No. 1 cupola	54.00-56.00
Heavy breakable cast	46.00
Unstripped motor blocks	48.00-50.00
Stove plate (f.o.b. plant)	40.00-42.00

LOS ANGELES

No. 1 heavy melting	55.00
No. 2 heavy melting	54.00
No. 1 bundles	54.00
No. 2 bundles	47.00
Machine shop turnings	32.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	62.00

SAN FRANCISCO

No. 1 heavy melting	55.00
No. 2 heavy melting	52.00
No. 1 bundles	54.00
No. 2 bundles	40.00
Machine shop turnings	35.00
Mixed borings, turnings	35.00
Cast iron borings	35.00
Heavy turnings	35.00
Short shovel turnings	38.00
Cut structurals	62.00

Cast Iron Grades

No. 1 cupola	57.00
Charging box cast	45.00-47.00
Stove plate	48.00
Heavy breakable cast	42.00
Unstripped motor blocks	50.00
Clean auto cast	57.00
No. 1 wheels	48.00
Drop broken machinery	60.00

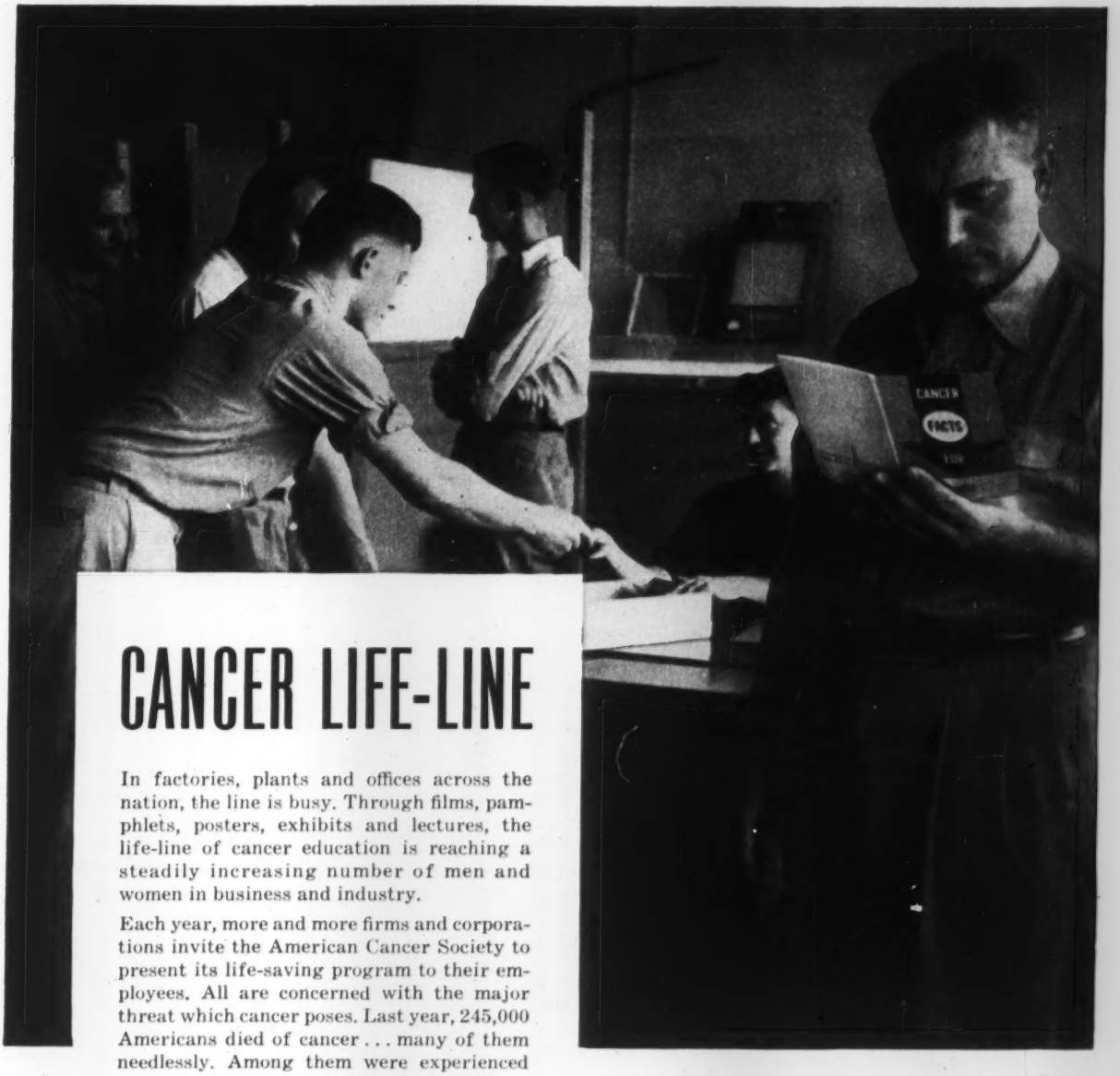
HAMILTON, ONT.

No. 1 heavy melting	54.00
No. 2 heavy melting	47.00
No. 1 bundles	54.00
No. 2 bundles	40.50
Mixed steel scrap	46.00
Busheling, new factory:	
Prepared	52.00
Unprepared	48.00
Short steel turnings	35.00

Cast Iron Grades†

No. 1 machinery cast	50.00

†F.o.b., Hamilton, Ont.



CANCER LIFE-LINE

In factories, plants and offices across the nation, the line is busy. Through films, pamphlets, posters, exhibits and lectures, the life-line of cancer education is reaching a steadily increasing number of men and women in business and industry.

Each year, more and more firms and corporations invite the American Cancer Society to present its life-saving program to their employees. All are concerned with the major threat which cancer poses. Last year, 245,000 Americans died of cancer . . . many of them needlessly. Among them were experienced executives, key officials, skilled workers. Their loss to business was incalculable. The greater loss, in terms of personal tragedy, was appalling.

Yet, thousands and thousands of them could have been saved *if they had known the importance of going to their doctors in time.* Early detection plus prompt treatment could literally mean the difference between life and death. This, and many other facts of life about cancer, are part of the education program which the American Cancer Society offers you – in your plant or factory. For additional information, call the American Cancer Society office nearest you, or write to "Cancer" in care of your local Post Office.

AMERICAN CANCER SOCIETY

First Quarter Outlook Good

Competition will be more intense, but most nonferrous metals will have a better than average January-March period. Aluminum, lead and zinc could set records

Nonferrous Metal Prices, Pages 102 & 103

AN over-the-shoulder look shows 1956 was a good but highly competitive year for most metals. The first quarter of 1957 promises more of the same.

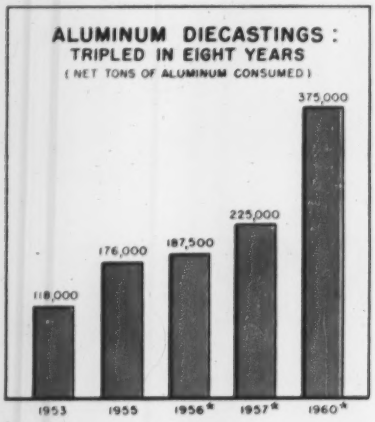
Copper — Despite all you hear about a slow market, the copper industry is going to end up with one of the best years in its history. Statistics from the Copper Institute show that primary crude production in 11 months of 1956 is slightly higher than it was in all of 1955. Refined production in December need be only 17,001 tons to push the 1956 total past 1955's. It has averaged 131,859 tons a month this year. Producers need to ship only 80,049 tons to fabricators this month to beat 1955's total. They've averaged 124,210 tons a month so far this year.

But the industry will have to turn to hard-sell tactics during the first quarter. Reasons: 1. With copper in oversupply, users are not interested in having more than a 30-day supply. 2. Three-year labor contracts give reasonable assurance that no artificial shortages caused by strikes will appear. 3. Tight money control will make most users cautious about ordering more than minimum tonnages. 4. Lack of oil in Europe is depressing demand for copper there.

The silver lining: Auto and appliance makers have worked off inventories. A big influx of orders from these industries will help bolster first quarter business.

Aluminum — About 1.69 million tons will be produced in the U.S. during '56. Total domestic mill shipments will be about 2.1 million tons. U.S. primary production reached 145,081 tons in November, reports the Aluminum Association. Total production for the first 11 months: 1,530,856 tons.

Since supply caught up with demand during the third and fourth quarters, the first quarter of next year will be an indicator of what the aluminum industry can expect for the next 12 to 18 months. With new capacity continuing to come in during '57, aluminum makers will concentrate on saturating established markets and trying to keep the primary ingot price at 27.10 cents a pound.



* Estimated.
Source: American Die Casting Institute.

Zinc—First quarter requirements for zinc will be at a record clip. Its two biggest users—diecasters and galvanizers — should continue at peak levels through the initial months of the year. The only cloud: Sagging foreign demand could cause an oversupply of the metal. But the Agriculture department probably will be the equalizer with its barter program.

Lead—Sales have been on a high plateau during most of '56. Tetraethyl lead producers and cable and battery makers will help keep lead shipments on an even keel throughout the coming year. Look for atomic energy applications (for such things as shielding) to have a more noticeable effect on lead sales in '57.

Nickel—There will be no easing of the critical nickel shortage. The military will take at least 40 per cent of the supply. The recent hike of 9.5 cents a pound, bringing the price to 74 cents a pound, may help intrigue other companies into entering the market. Outlook: It may be 1960 before supply catches up with demand. In the interim, government surveys and Senate investigating committees will try to solve the distribution problem.

Titanium — Mill production will total 5300 tons this year, reports T. W. Lippert, sales manager, Titanium Metals Corp. of America. Their market value is set at $130 million. Other TMCA estimates: About 11,500 tons of titanium ingot were produced in 1956. The sponge total will be about 14,500.

As the price tumbles (now $2.75 per lb for sponge), more companies become interested. Kennecott Copper Corp. and Allied Chemical & Dye Corp. have announced the formation of a joint subsidiary to produce titanium metal.

Next year's outlook: Some 11,500 tons of products will roll from the mills, predicts Mr. Lippert.

NONFERROUS PRICE RECORD

	Price Dec. 19	Last Change	Previous Price	Nov. Avg.	Oct. Avg.	Dec., 1955 Avg.
Aluminum ..	27.10	Aug. 10, 1956	25.90	27.100	27.100	24.400
Copper	35.50-36.00	Nov. 28, 1956	36.00	35.956	38.365	46.053
Lead	15.80	Jan. 13, 1956	16.30	15.800	15.800	15.358
Magnesium .	35.25	Aug. 13, 1956	33.75	35.250	35.250	32.500
Nickel	74.00	Dec. 6, 1956	64.50	64.500	64.500	64.500
Tin	103.00	Dec. 19, 1956	103.125	111.049	105.981	107.980
Zinc	13.50	Jan. 6, 1956	13.50	13.500	13.500	13.000

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, pig, 99.8%, Velasco, Tex.

He's within an inch of his life...

but U. S. Matchless Steam Hose *kills all the risk*

Scalding steam—a roaring, raging demon hot enough to cause severe injury or death on contact—is tamed and controlled by U. S. Matchless® Steam Hose. After long, safe service (even with steam pressures up to 200 pounds) the wall structure, instead of bursting, allows a trickle of steam to merely *leak* through—acting as a safety valve and giving notice that it's finally time for a replacement. That's why plant safety councils everywhere firmly approve of the U. S. Matchless.

This great hose delivers long service. Despite its great strength, it is as flexible and easy to handle as cotton hose. It is used for steam lines in railroad yards and in roundhouses, steam pile drivers, steam supply lines from docks to oil barges, and steam lines in manufacturing plants. Other important uses are fire protection in oil refineries, thawing out tank cars, steaming out drums in chemical, soap and paper plants and paper mill black liquor recovery systems. U. S. Matchless Steam Hose is obtainable through any of the 28 "U. S." District Sales Offices, or write us at Rockefeller Center, New York 20, N. Y.

Mechanical Goods Division

United States Rubber

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 27.10; pigs, 25.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.90; No. 43, 28.70; No. 195, 30.30; No. 13, 28.90; No. 43, 28.70; 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic, 36.00 deld. Conn. valley; 36.00 deld. Midwest; custom smelters, 35.50-36.00 deld.; lake, 36.00 deld.; fire refined, 35.75 deld.

Germanium: First reduction, $201.85-$220 per lb; intrinsic grade, $220-$242.67 per lb, depending on quantity.

Gold: U.S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $100-$110 nom. per troy oz.

Lead: Common, 15.80; chemical, 15.90; corroding, 15.90, St. Louis. New York basis, add 0.20.

Lithium: 98+%, cups or ingots, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: Pig, 35.25; ingot, 36.00, f.o.b. Velasco, Tex. 13 in. sticks, 59.00, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91B (diecasting), 37.25 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $255-$257 per 76-lb flask.

Molybdenum: Extruded ingot, $9.60 per pound, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot or ingots for addition to cast iron, 74.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01.

Osmium: $80-$100 per troy oz, nom.

Palladium: $23-$24 per troy oz.

Platinum: $103-$106 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $13.50-$15.50 per lb.

Silver: Open market, 91.375 per troy oz.

Sodium: 16.50, c.l.; 17.00, l.c.l.

Tantalum: Sheet, rod, $68.70 per lb; powder, $56.63 per lb.

Tellurium: $1.65-$1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot, 103.00; prompt 102.75.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max), $2.75; grade A-2 (0.5% Fe max), $2.50 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $4.20 per lb, nom, f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $5. Treated ingot, $6.70.

Zinc: Prime Western, 13.50; brass special, 13.75; intermediate, 14.00, East St. Louis, freight allowed over 0.50 per pound. New York basis, add 0.50. High grade, 14.85; special high grade, 15.25 deld. Diecasting alloy ingot No. 3, 18.00; No. 2, 19.00; No. 5, 18.50, deld.

Zirconium: Ingots, commercial grade, $14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, commercial grade, $10 per lb; reactor grade, $14-$22 per lb, depending on quantity. Powder electronics grades, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 25.25-30.00; No. 12 foundry alloy (No. 2 grade), 23.50-24.00; 5% silicon alloy, 0.60 Cu max, 26.00-26.25; 13 alloy, 0.60 Cu max, 26.00-26.25; 195 alloy, 26.00-26.50; 108 alloy, 24.00. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.75; grade 2, 23.00, grade 3, 22.25; grade 4, 21.75.

Brass Ingot: Red brass, No. 115, 35.00; tin bronze, No. 225, 46.00; No. 245, 41.50; high-leaded tin bronze, No. 305, 38.50; No. 1 yellow, No. 405, 27.50; manganese bronze, No. 421, 30.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 37.50; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nominal 1.9% Be alloy). Strip, $1.86-$1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.88, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 41.355; l.c.l., 41.98. Weatherproof, 30,000-lb lots, 40.78; l.c.l., 41.53. Magnet wire deld., 15,000 lb or more, 48.68; l.c.l., 49.43.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more, $21.50 per cwt; pipe, full coils, $21.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheet and strip, $11.00-$14.75; sheared mill plate, $9.25-$11.25; wire $8.50-$11.00; forging billets, $6.85-$7.10; hot-rolled and forged bars, $7.10-$7.35.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 24.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $20.35; H.R. strip, $23.95; C.R. strip, $32.00; forged or H.R. bars, $18.40; wire, 0.015 in., 8.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheet and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed)

Thickness Range, Inches	Flat Sheet	Coiled Sheet
0.249-0.136	40.90-45.40	....
0.135-0.096	41.40-46.50	37.70-39.60
0.095-0.077	42.10-48.30	37.80-39.80
0.076-0.061	42.70-50.60	38.20-40.50
0.060-0.048	43.40-52.90	38.80-41.50
0.047-0.038	43.90-55.60	38.60-42.90
0.037-0.030	44.30-50.00	40.40-44.70
0.029-0.024	44.90-52.40	41.00
0.023-0.019	45.80-52.20	42.00
0.018-0.017	46.60-53.30	42.60
0.016-0.015	47.50-53.90	43.40
0.014	48.50-50.90	44.40
0.013-0.012	49.70-52.10	45.10
0.011	50.70-53.70	46.30
0.010-0.0095	52.10-54.40	47.60
0.009-0.0085	53.40	49.10
0.008-0.0075	55.00	50.03
0.007	56.50	51.80
0.006	58.10	53.20

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	40.2	44.5
5050-F	41.3	45.6
3004-F	42.3	47.5
5052-F	42.9	48.2
6061-T6	44.4	50.0
2024-T4*	48.1	54.4
7075-T6*	55.4	62.5

*28-48 in. widths or diam, 72-180 lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	74.30	71.50	....	....
0.156-0.172	63.00	60.40	....	....
0.188	63.00	60.40	....	76.40
0.219-0.234	59.70	57.20	....	....
0.250-0.281	59.70	57.20	....	73.00
0.313	59.70	57.20	....	69.60
0.344	58.50	....	....	....
Cold-finished				
0.375-0.547	58.80	57.50	70.10	65.50
0.563-0.688	58.80	57.50	66.70	61.60
0.750-1.000	57.40	56.00	61.00	58.10
1.063	57.40	56.00	....	58.10
1.125-1.500	55.20	53.90	59.00	56.10
Rolled				
1.563	53.70	52.40	....	....
1.625-2.000	53.10	51.60	....	....
2.125-2.500	51.70	50.30	....	....
2.563-3.375	50.20	48.70	....	....

Forging Stock: Round, Class 1, 43.30-55.90 in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 48.10-63.20 in random lengths, 0.375-4 in. thick width 0.750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
⅜	$18.45	2	$ 57.00
1	29.00	4	157.20
1¼	39.25	6	281.65
1½	46.95	8	423.80

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	45-90-47.50	61.50-65.80
12-14	46.20-47.70	62.20-66.80
15-17	46.40-48.30	63.50-68.50
18-20	47.00-48.80	65.50-71.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.0, 93.30. Thread plate, .188 in., 71.70; .250-2.0 in., 70.60; Tooling plate, .250-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 14.00-14.50; old sheets, 11.00-11.50; borings and turnings, 7.50-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	58.13b	55.36c	....	58.32	32.000	32.000	31.250
Yellow Brass	50.19	40.17d	50.73	53.10	24.625	24.375	22.625
Low Brass, 80%	53.40	53.34	53.94	56.21	27.375	27.125	26.625
Red Brass, 85%	54.54	54.48	55.08	57.35	28.500	28.250	27.750
Com. Bronze, 90%	56.23	56.17	56.77	58.79	29.500	29.250	28.750
Manganese Bronze	57.88	51.98	62.22	....	23.000	22.750	22.250
Muntz Metal	52.19	48.00	....	....	23.125	22.875	22.375
Naval Brass	54.14	48.45	61.20	57.55	23.000	22.750	22.250
Silicon Bronze	62.44	61.63	62.48	64.61	31.250	31.000	30.250
Nickel Silver, 10%	66.66	68.99g	68.99	....	30.875	30.675	15.438
Phos. Bronze, A 5%	77.25	77.75	77.75	79.18	33.000	32.750	31.750

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded

8.00; crankcases, 11.00-11.50; industrial castings, 11.00-11.50.

Copper and Brass: No. 1 heavy copper and wire, 27.25-27.75; No. 2 heavy copper and wire, 25.75-26.25; light copper, 23.25-23.75; No. 1 composition red brass, 24.50-25.00; No. 1 composition turnings, 23.50-24.00; yellow brass turnings, 13.50-14.00; new brass clippings, 20.50-21.00; light brass, 14.50-15.00; heavy yellow brass, 16.00-16.50; new brass rod ends, 18.00-18.50; auto radiators, unsweated, 18.00-18.50; cocks and faucets, 18.50-19.00; brass pipe, 19.50-20.00.

Lead: Heavy, 12.50-13.00; battery plates, 7.00-7.25; linotype and stereotype, 13.00-14.00; electrotype, 12.50-13.00; mixed babbitt, 13.00-14.50.

Monel: Clippings, 75.00-90.00; old sheets, 75.00-80.00; turnings, 70.00-80.00; rods, 75.00-90.00.

Nickel: Sheets and clips, 140.00-185.00; rolled anodes, 140.00-185.00; turnings, 125.00-160.00; rod ends, 140.00-185.00.

Zinc: Old zinc, 4.50-5.50; new die-cast scrap, 4.00-4.50; old die-cast scrap, 2.50-3.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 18.75-19.00; 3003 clippings, 18.75-19.00; 6151 clippings, 18.75-19.00; 5052 clippings, 18.25-19.00; 2014 clippings, 18.00-18.25; 2017 clippings, 18.00-18.25; 2024 clippings, 18.00-18.25; mixed clippings, 17.25-18.00; old sheets, 15.75-16.50; old cast, 15.75-16.25; clean old cable (free of steel), 17.75-19.00; borings and turnings, 15.50-17.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 58.00; light scrap, 54.00; turnings and borings, 38.00.

Copper and Brass: No. 1 heavy copper and wire, 30.75; No. 2 heavy copper and wire, 29.25; light copper, 27.00; refinery brass (60% copper) per dry copper content, 27.25.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 30.75; No. 2 heavy copper and wire, 29.25; light copper, 27.00; No. 1 composition borings, 27.00; No. 1 composition solids, 27.50; heavy yellow brass solids, 19.00; yellow brass turnings, 18.00; radiators, 21.50.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 54.79; oval, 53.92, 5000-10,000 lb; electrodeposited, 45.78; 2000-5000 lb lots; cast, 48.04, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, $1.015; 10-499 lb, 99.50; 500-4999 lb, 95.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab; less than 200 lb, 121.50; 200-499 lb, 120.00; 500-999 lb, 119.50; 1000 lb or more, 119.00.

Zinc: Balls, 21.00; flat tops, 21.00; flats, 22.75; ovals, 22.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb, in 100-lb drums.

Chromic Acid: Less than 10,000 lb, 30.25, over 10,000 lb, 29.50.

Copper Cyanide: 100-1000 lb, 80.50.

Copper Sulphate: 500-1900 lb, 21.15; 2000 lb and over, 18.65.

Nickel Chloride: 10 lb, 46.50; 200 lb, 44.50; 300 lb, 43.50; 400-4900 lb, 41.50; 5000-9900 lb, 39.50; 10,000 lb and over, 38.50. Prices eastern delivery.

Nickel Sulphate: 100 lb, 38.25; 200 lb, 36.25; 300 lb, 35.25; 400-4900 lb, 33.25; 5000-35,900 lb, 31.25; 36,000 lb, 30.35. Prices eastern delivery.

Sodium Cyanide: Egg, under 1000 lb, 19.80; 1000-19,900 lb, 18.80; 20,000 lb and over, 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb, 72.80; 100-600 lb, 64.30; 700-1900 lb, 61.80; 2000-9900 lb, 60.10; 10,000 lb or more, 58.90.

Stannous Chloride (anhydrous): Less than 25 lb, 170.20; 25 lb, 135.20; 100 lb, 120.20; 400 lb, 117.70; 5200-19,600 lb, 105.50; 20,000 lb or more, 93.30.

Stannous Sulphate: Less than 50 lb, 132.70; 50 lb 102.70; 100-1900 lb, 100.70; 2000 lb or more, 98.70.

Zinc Cyanide: Under 1000 lb, 55.55; 1000 lb and over, 53.55.

(*Concluded from page 97*)

ported this late in any year on record. The previous high for a comparable week was in 1950 when the total amounted to only 31,371 tons.

Shipments last week brought the total for the season (up to Dec. 17) to 77,586,046 tons. This compares with 87,459,853 in the 1955 season. The all-time record was 95 million tons in 1942.

Shipments of iron ore on the Great Lakes in November were the second largest for the month on record, reports the Lake Carriers' Association. The 8,801,168 gross tons moved compared with 7,409,793 in 1955. The record: 9,294,947 tons in November, 1952.

The Pittsburgh Steamship Division, U. S. Steel Corp., has seven vessels still downbound with cargoes. Expectations are these will add some 60,000 tons to the movement.

Pig Iron . . .

Pig Iron Prices, Page 93

Many gray iron foundries will not open on the two Mondays preceding the holidays. It is expected that production so lost will be made up by operating on Saturdays or on longer work-day schedules. So pig iron consumption isn't likely to suffer from the holiday shutdowns in December.

Shops serving the automotive industry continue to increase melting schedules as new model assembly lines hit full stride.

Trade interests are looking for a pickup in merchant iron demand in the first quarter.

Steel mills continue to use an unusually high percentage of iron in their open-hearth melts to counteract high scrap prices. There has been little stockpiling of iron at the mill level.

With Bethlehem Steel Co. withdrawing from the merchant pig

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iron market Jan. 1, indications are that the Swedeland, Pa., furnaces of Alan Wood Steel Co. will be the governing base on deliveries into New York City and Newark, N. J.

If this proves correct, minimum delivered prices on the major grades into New York and Brooklyn, N. Y., will be up $1.90 a gross ton; into Newark, up 60 cents. These advances represent the difference in the freight rates from Swedeland to these points and those from Bethlehem, Pa. The new prices take into account the just announced 7 per cent increase in freight rates. The new rate from Swedeland to New York is $6.195; to Newark, $4.01, not including the 3 per cent federal tax.

The smaller of the two Swedeland furnaces was scheduled to be blown out Jan. 1 for rehabilitation and enlargement. This project would have required at least a few months and would leave the company with little iron for the merchant trade. In fact, the company has been curtailing its allotments to the merchant trade substantially for several weeks in an effort to accumulate needed inventory.

But plans were revised recently. The smaller furnace will not be blown out for another two or three months, depending upon how efficiently the stack can be operated. If the furnace continues in operation beyond the first of the year, the company probably will not have much merchant iron for sale.

Indications are that Swedeland will also continue to be the governing base point on basic, No. 2 foundry, malleable and bessemer iron delivered to Philadelphia after the first of the year. But the price on low phos iron to Philadelphia consumers will be higher after Jan. 1 due to the withdrawal of Bethlehem. It will force buyers to rely largely on the Troy, N. Y., furnace of Republic Steel Corp. At present, the low phos iron price is based on the Bethlehem stack at Steelton, Pa.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 94

Production of coke in October increased 4 per cent to 6,740,182 net tons, reports the Bureau of Mines. Of the total, 6,554,091 tons were oven coke, and 186,091, beehive. Stocks of oven coke at the end of the month totaled 2,598,188 tons, equal to 12.3 days of production, and off 8.2 per cent from the preceding month. On the corresponding date a year ago, stocks were 1,781,504 tons.

In the first ten months of 1956, output amounted to 61,009,145 tons, compared with 61,864,800 tons in the like period last year. Of total production, 58,990,309 tons were oven coke, against 60,569,200 in 1955, and 2,018,836 tons of beehive, against 1,295,600.

Ferroalloys . . .

Ferroalloy Prices, Page 95

Higher prices on some manganese and silicon alloys and all nickel-bearing alloys were announced on Dec. 15 by the Electro Metallurgical Co., a division of Union Carbide & Carbon Corp. The hikes stem from increased prices on manganese ore, ocean freight, steel scrap and nickel. The average increase is 5.6 per cent. For contract users, new quotations are effective Jan. 1.

The table below lists products affected, old and new base prices and the amount of the increase. All increases are flat across the board. There is no change in quantity, sizing, packing or spot differentials.

	Base Price		Increase
	New	Old	
MANGANESE ALLOYS			
Standard ferromanganese	$0.1275	$0.1175	$0.0100
Ferromanganese briquets	0.1480	0.1390	0.0090
Medium-carbon ferromanganese	0.2550	0.2415	0.0135
Low-carbon ferromanganese (low-phos)	0.3715	0.3580	0.0135
Silicomanganese (0.150% carbon)	0.1380	0.1295	0.0085
Silicomanganese briquets	0.1510	0.1440	0.0070
Low-iron ferromanganese	0.2350	0.2215	0.0135
SILICON ALLOYS			
50% ferrosilicon	0.1390	0.1350	0.0040
Silicon briquets	0.0770	0.0755	0.0015
Ferroaluminum-Silicon	0.1655	0.1625	0.0030
NICKEL-BEARING ALLOYS			
Nickel-Boron	1.95	1.85	0.1000
Nickel-Zirconium	1.80	1.75	0.0500
Manganese-Nickel-Titanium	1.70	1.65	0.0500
Nickel-Molybdenum	2.00	1.95	0.0500
Nickel-Magnesium	1.85	1.75	0.1000

Monsanto Chemical Co. increases the price of ferrophosphorus $10 per gross ton, effective Jan. 1. This brings lump size in carload quantities to $110 a ton. Other sizes and quantities also are to be increased $10.

Production (205,015 tons) and shipments (204,882 tons) of silicon alloys during the third quarter declined 12 per cent and 11 per cent, reports the Bureau of Mines. Compared with the same period of 1955, production dropped 0.5 per cent, and shipments 10 per cent.

Stocks on hand at the end of September totaled 119,275 tons, slightly higher than the 118,826 tons on hand at the end of June.

Apparent consumption (shipments, plus imports, minus exports) declined 11 per cent, compared with the same period of 1955. Imports of ferrosilicon and metal of 6058 tons contained 1681 tons of silicon valued at $535,487. Exports of 402 tons were valued at $131,631.

Warehouse . . .

Warehouse Prices, Page 93

Most distributors are experiencing a seasonal letup, although the month has been active until now. Orders are likely to shrink over the balance of the year because many manufacturing plants will be closed for longer than normal holiday periods. Potential demand is unusually large.

Plates and shapes at the warehouse and mill level fall short of available supplies — a situation which is coming to be considered "normal." Bars and hot-rolled sheets have been moving well. Only in cold-rolled sheets, among the major items, has trading been rather disappointing.

Distributors on the West Coast are worried about stocks, but are hopeful that accelerated mill operations will enable them to balance their inventories early in the new year. They have adopted an informal allocation plan to take care of buyers who usually are supplied by mills. This step has been taken to keep their inventories from being completely depleted.

Advertising Index

Abell-Howe Co. 96

Allegheny Ludlum Steel Corporation 22

Allis, Louis, Co., The 90

Armco Steel Corporation 30

Bethlehem Steel Co. 1, 106

Blaw-Knox Co., Foundry & Mill Machinery Division 14, 15

Bullard Co., The 46

Cattie, Joseph P., & Brothers, Inc. 96

Cincinnati Shaper Co., The 3

Cleveland Worm & Gear Co., The ..... Inside Back Cover

Cold Metal Products Co., The 29

Colorado Fuel & Iron Corporation, The 89

Cone Automatic Machine Co., Inc. 42

Copperweld Steel Co., Steel Division 49

Crucible Steel Company of America 17

Cutler-Hammer, Inc. ..... Back Cover

DoAll Co., The 10

Eastern Machine Screw Corporation, The 96

Electric Controller & Mfg. Division of Square D Co. ..... Inside Front Cover

General Motors Corporation, Saginaw Steering Gear Division 71

Goodyear Tire & Rubber Co., Inc., The, Industrial Products Division 4

Hamilton Foundry & Machine Co., The 23

Hyde Park Foundry & Machine Co. 105

Kaiser Steel Corporation 103

Kearney & Trecker Corporation, Special Machinery Division 76, 77

Koppers Co., Inc. 18, 19

Lenco, Inc. 6

McKay Machine Co., The 41

Morgan Engineering Co., The 11

National Steel Corporation 78

Niagara Machine & Tool Works 20, 21

Pittsburgh Engineering & Machine Co., Division of Pittsburgh Steel Foundry Corporation 71

Republic Steel Corporation 8, 9

Roebling's, John A., Sons Corporation, A Subsidiary of The Colorado Fuel & Iron Corporation 89

Ryerson, Joseph T., & Son, Inc. 32

Saginaw Steering Gear Division, General Motors Corporation 62

Service Steel 96

Sewall, E. B., Manufacturing Co. 82

SKF Industries, Inc. 2

Somers Brass Co., Inc. 53

Square D Co., Electric Controller & Mfg. Division ..... Inside Front Cover

Standard Conveyor Co. 12

Standard Tube Co., The 7

Surface Combustion Corporation 56, 57

Teiner, Roland, Co., Inc. 5

Texas Co., The 26

Timken Roller Bearing Co., The, Steel & Tube Division 50

Tinnerman Products, Inc. 54

Torrington Co., The, Swaging Machine Division 69

United States Rubber Co., Mechanical Goods Division 101

Weirton Steel Co. 78

Westinghouse Electric Corporation 24, 25

Youngstown Sheet & Tube Co., The 13

~ ~ ~

Table of Contents, Page 5

Classified Advertising, Page 103

for all types of
HYDRAULIC EQUIPMENT

Hyde Park Rams are available in Chilled or Alloy Iron.

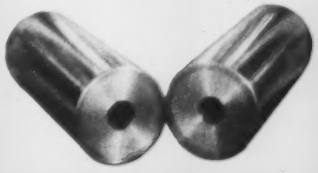
Furnished in hardness range to meet your specification . . . ground to your required size.

On your next replacement of Rams — or for new equipment—consult us. Our engineers will be glad to assist you.

Red Circle Rolls for every Purpose

Rolling Mill Equipment

Gray Iron Castings up to 80,000 lb.



Hyde Park
FOUNDRY & MACHINE CO.
Hyde Park, Westmoreland Co., Pa.
ROLLS
ROLLING MILL MACHINERY
GREY IRON CASTINGS

Superior Fireplace Company, Baltimore and Los Angeles, builds attractive steel fireplaces like the one depicted here.

How steel sheets keep the home fires burning

There's a warmth by the family fireside that's more than just a matter of BTU's. Rather it is a kind of human warmth that seems to draw family and friends a little closer together. Perhaps this accounts for the enduring popularity of fireplaces in the home.

Today almost any American home can enjoy the cheer of a hearth, thanks to "packaged" fireplaces made of sheet steel. Many of these efficient, popular-priced steel fireplaces are made from Bethlehem sheets. And just in the past decade the tonnage for this application has grown by leaps and bounds.

This is but one example from a growing list of steel products which have recently become important consumers of sheets. At the same time, of course, longer-established users have been upping their sheet requirements, too.

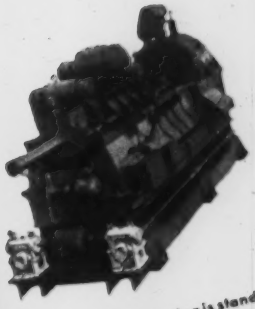
All of which totals up to unprecedented pressure on our sheet-rolling facilities (and they've grown quite a bit themselves!). Needless to say, we are doing everything we can to keep our customers supplied with the Bethlehem hot- and cold-rolled sheets they need to keep their production lines flowing.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



Cleveland worm gearing is standard on these fully-automatic machines which thread oil field pipe to rigid A.P.I. specifications, ranging from 1¼" to 13⅜" O.D. In addition to worm gearing inside the machine, note two Cleveland Worm Gear Speed Reducers in foreground.

On job 18 years, CLEVELAND drive is good as new

AFTER 18 years of continuous service in a well-known pipe mill in Pennsylvania, a Stamets pipe threading machine had its first major overhaul. When the Cleveland worm gearing was removed from the machine it looked almost like new, showed only slight traces of wear. This unretouched photograph reveals the splendid condition of both the worm and gear. In fact, the gearing is in such fine shape that it was put right back in the machine—probably good for another 18 years of strenuous pipe threading.

This example is one of thousands of Cleveland worm gear drives, many made 25 and even 30 years ago that are still in service today. They serve in every phase of American industry, drive every type of mechanical equipment where a powerful, trouble-free, right-angle drive is wanted.

For full presentation of the many types and sizes of Cleveland worm-gear drives available, write for Catalog 400. The Cleveland Worm & Gear Co., 3270 E. 80th St., Cleveland 4, Ohio.

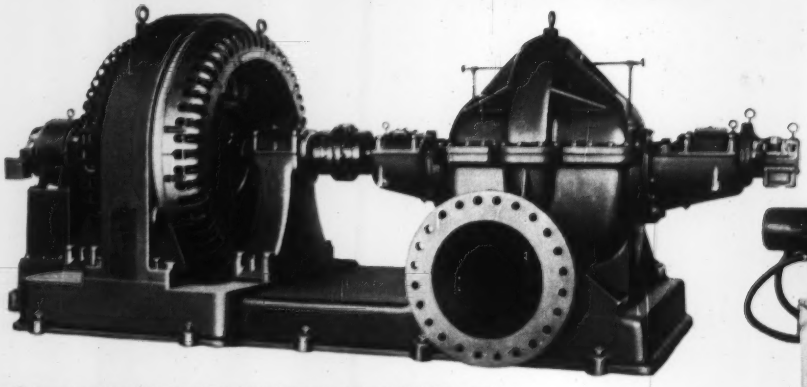
Affiliate: The Farval Corporation, Centralized Systems of Lubrication.
In Canada: Peacock Brothers Limited.

CLEVELAND
Worm Gear
Speed Reducers

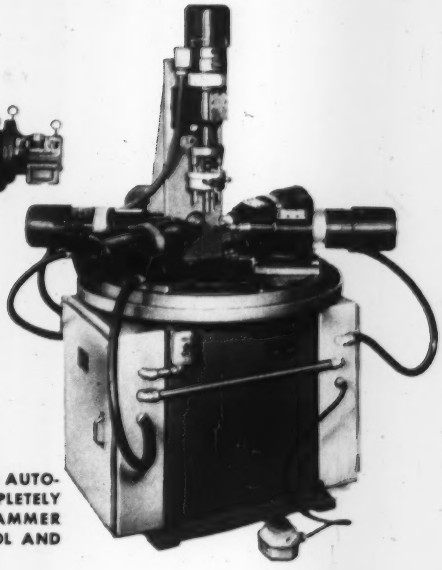
Choice of the Leaders

CUTLER-HAMMER
MOTOR CONTROL
C-H

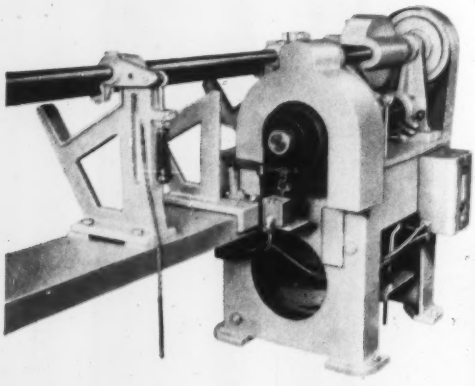
The Mark of Better Machines



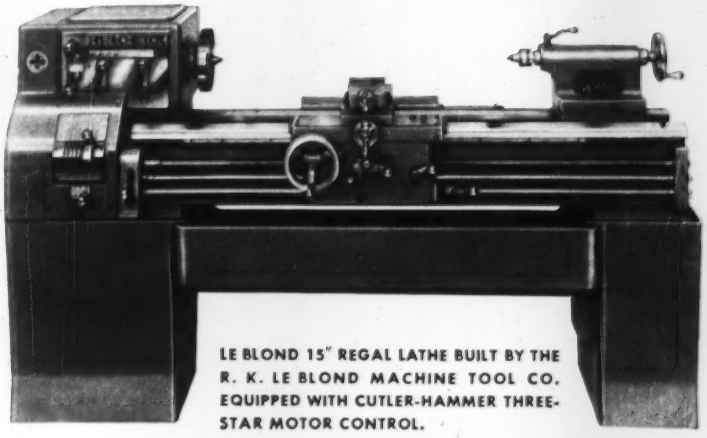
24" MOTOR DRIVEN DOUBLE SUCTION, SINGLE STAGE CENTRIFUGAL PUMP MANUFACTURED BY FAIRBANKS, MORSE & CO. MOTOR CONTROL SUPPLIED BY CUTLER-HAMMER.



GOVRO-NELSON COMPANY'S AUTOMATIC DRILLING UNIT. COMPLETELY EQUIPPED WITH CUTLER-HAMMER THREE-STAR MOTOR CONTROL AND ACCESSORIES.



THE SHUSTER AUTOMATIC WIRE STRAIGHTENING AND CUT-OFF MACHINE, MANUFACTURED BY THE METTLER MACHINE TOOL CO. CUTLER-HAMMER THREE-STAR MOTOR CONTROL IS SUPPLIED AS STANDARD ORIGINAL EQUIPMENT.



LE BLOND 15" REGAL LATHE BUILT BY THE R. K. LE BLOND MACHINE TOOL CO. EQUIPPED WITH CUTLER-HAMMER THREE-STAR MOTOR CONTROL.

Signet of Progress

Winning recognition as a leader in any industry is not easy. But holding that position of leadership year after year is much more difficult. The goal of all competition is to overtake and excel the leader. Recognized leaders among machinery builders *know* they cannot stand still; their machines must forever offer new advanced features, the most advanced construction, the finest in components.

It is very significant that more and more leading machinery builders have standardized on Cutler-Hammer Three-Star Motor Control and Cutler-Hammer Heavy Duty Oil-Tight Pushbuttons and control accessories. Such selections have naturally resulted from careful comparison and proven superiority. When you buy new machines, check the control equipment offered and you will see that Cutler-Hammer Motor Control is clearly the choice of the leaders, definitely the mark of better machines. CUTLER-HAMMER, Inc., 1211 St. Paul Avenue, Milwaukee 1, Wisconsin. *Associate:* Canadian Cutler-Hammer, Ltd., Toronto, Ontario.